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Accounting reports in business management
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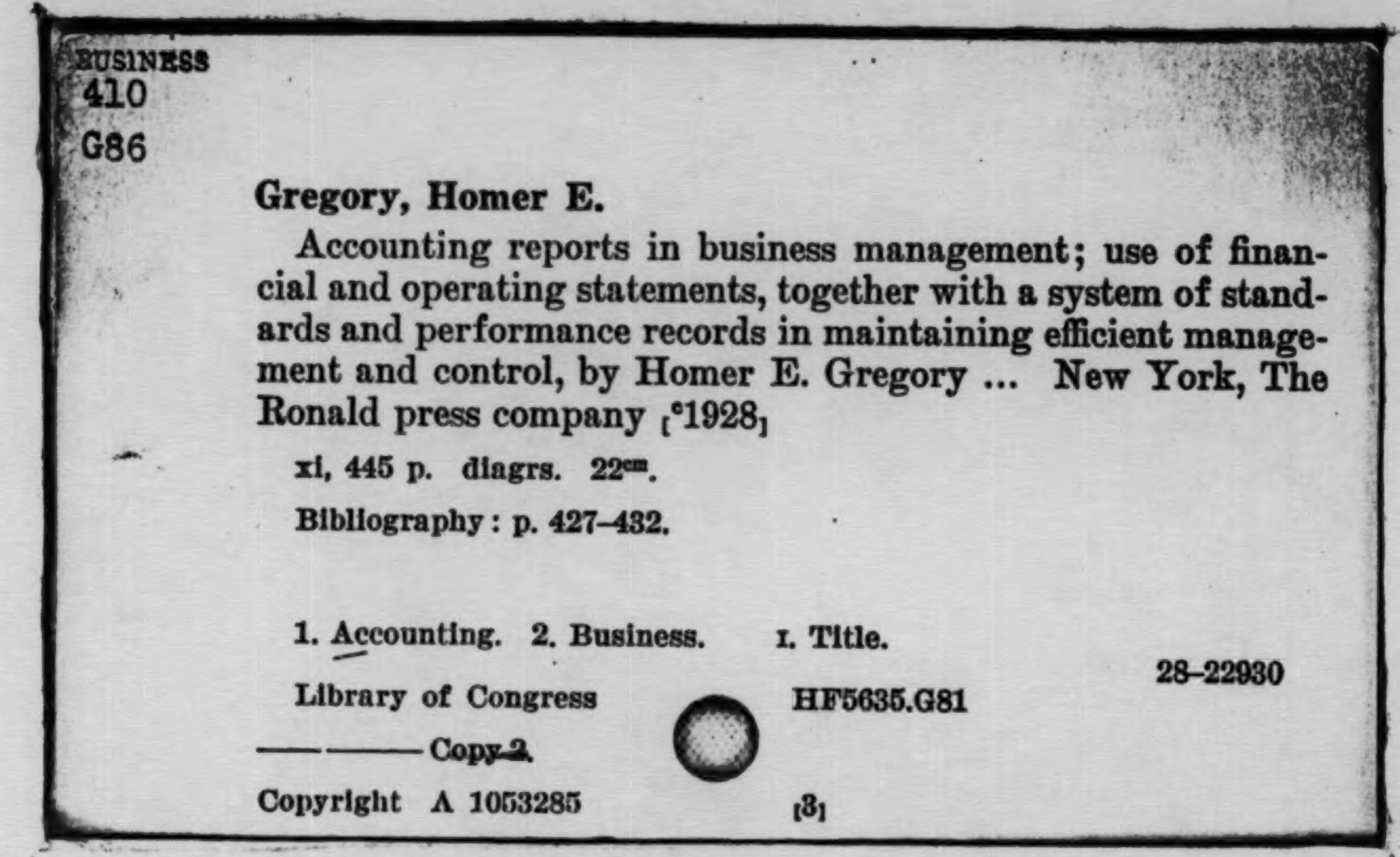

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Gregory, Homer E.

Accounting reports in business management; use of financial and operating statements, together with a system of standards and performance records in maintaining efficient management and control, by Homer E. Gregory ... New York, The Ronald press company [°1928]

xi, 445 p. diagrs. 22cm.

Bibliography: p. 427-432.

1. Accounting. 2. Business. I. Title.

Library of Congress HF5635.G81 28-22930

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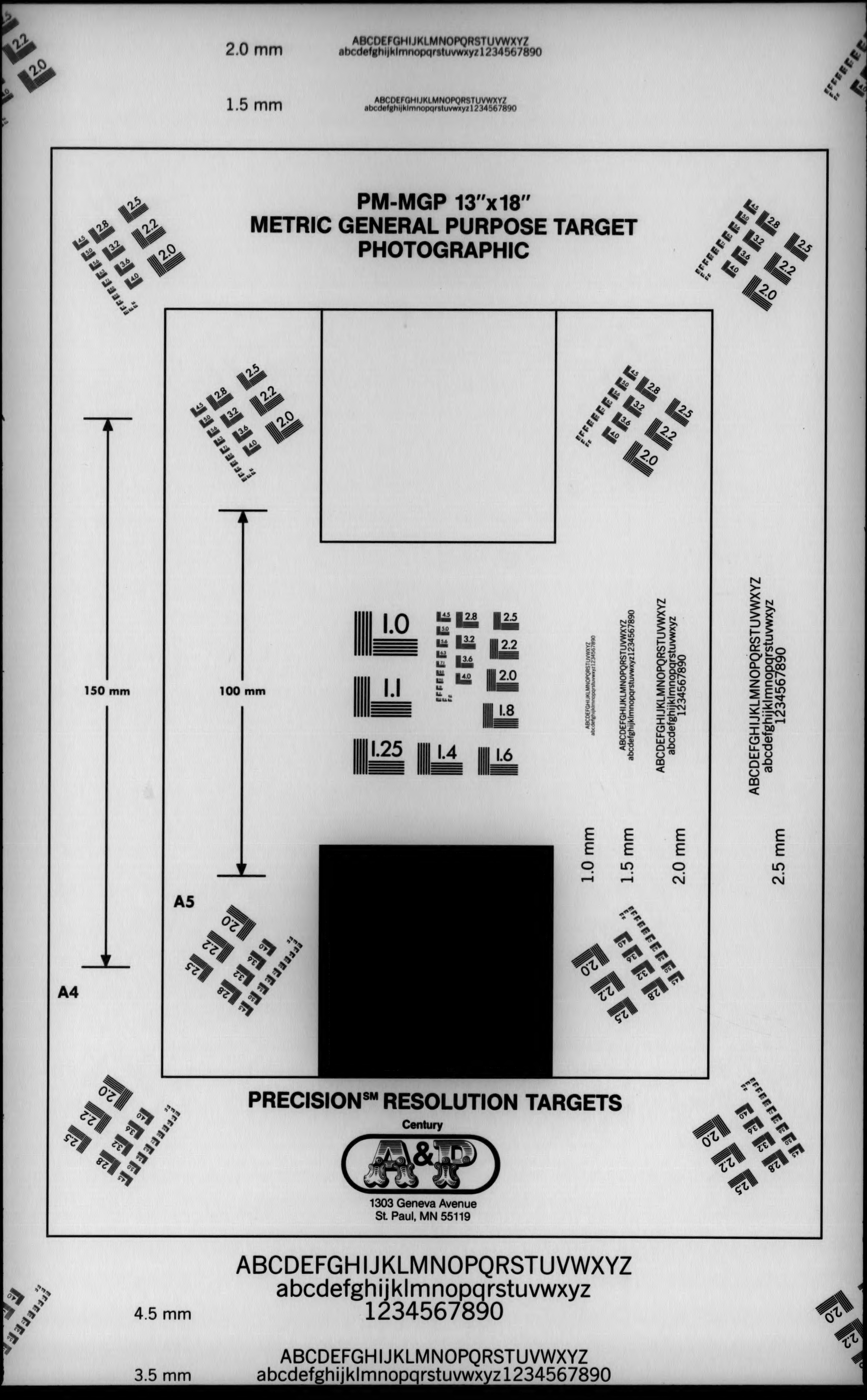
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ACCOUNTING REPORTS IN BUSINESS MANAGEMENT

Use of Financial and Operating Statements, together with a System of Standards and Performance Records, in Maintaining Efficient Management and Control

By

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THE RONALD PRESS COMPANY
NEW YORK

Bus
28-39465

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PREFACE

This volume is concerned with analyzing the balance sheet, the profit and loss and other operating statements of a business from the internal or managerial point of view, and in general with the control of its finances and operations by means of various standards, measurements and records, including not only statement analysis, but such devices as standard costs and budgets.

In addressing himself to this task, the writer has kept uppermost the interests of three groups: (1) comptrollers or head accountants, whose function it is to assemble and interpret all of the critical accounting and statistical facts of a business; (2) functional managers, who are held responsible for the carrying out of the operating and financial policies of these concerns; and (3) corporate directors, who are charged with the responsibility of maintaining solvency, operating efficiency, and ultimate profit making of going concerns. This emphasis on the managerial-control approach tends to enlarge the viewpoint of all students of the subject, and to give a broader idea of the internal analysis of financial as well as operating statements.

The distinctive viewpoint is that of the owner-manager who is looking upon the reports of a concern, not as answers to correct accounting classification and definition problems, but as a fundamental explanation of the security that he, as an interested party, derives from the accounts of a going concern. Financial statements in the last analysis represent the discharge of managerial responsibility in protecting a business adequately against its natural enemies. To show what management is doing in order to make the investment safe and improve operating efficiency, thereby reducing the risk of ownership, is the outstanding feature of accounting reports.

In this work an analysis first is made of the business hazards that management faces. Next, the financial-physical standards and records used to measure the performance that gives protection against these hazards are explained. Finally, an analysis is made of how the discharge of this protective function is revealed in the financial reports.

The book is an interpretation of the function of accounting as conceived in scientific management. It is intended to encourage and promote a wider appreciation of the field of comptrollership and a broadening of the accounting work of the internal auditor, so as to include in his responsibility a system of standards and performance records that would cover more than the usual balance sheet and profit and loss statements, as he now conceives them—enough more to include all the activities of the business institution that have a pecuniary significance. For college and university classes the volume contains laboratory exercises based directly upon the text material. There is also a selected bibliography arranged by chapters.

Use has been made in the volume of the material prepared by the writer, for Chapter VII in "Investments," published by the American Institute of Banking.

The author's viewpoint has been influenced by the work of Dean L. C. Marshall, of the University of Chicago; Mr. George E. Frazer, C.P.A., former lecturer at the University of Chicago; and by the writings of J. O. McKinsey, C.P.A., in his recent books. Works on scientific management have been freely consulted. Acknowledgment is also made to Professor Carl S. Dakan, Instructor Charles J. Miller, Instructor Charles E. Calhoun, all of the University of Washington, for assistance in reading the manuscript. Special thanks are due to Mr. L. Presley Gill, who assisted with the proofreading; to Mr. James P. Robertson, C.P.A., who supplied portions of the material for Chapters XXI and XXII on Budgets, and to Professor W. E. Cox, Dean of the College of Business Administration of the University of Washington, for many helpful suggestions and for reading parts of the manuscript.

HOMER E. GREGORY

University of Washington,
August 16, 1928.

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ACCOUNTING REPORTS
IN
BUSINESS MANAGEMENT

CHAPTER I

ACCOUNTING AS A CONTROL DEVICE

Conservation of Capital Management's Responsibility.—One of the outstanding characteristics of modern business, especially among competitive concerns, is the relatively large number of business failures and the correspondingly great losses of invested capital. The sinking of millions of dollars into unsuccessful business ventures by investors; the abandonment of enterprises on the part of owners; and the incoming of new capital and of new owners and managers to take the place of the old, are some of the serious accompaniments of the "turnover" of business enterprises brought about by unseasoned attempts to start something new, or in the further attempt to revive old concerns that are beset by financial difficulties.

Business men who are keenly alive to their responsibilities, as managers and directors, are cognizant of the fact that they are engaged in the work of protecting business against its natural enemies. It is often true that operations as such are subordinated to this greater trust of protecting the investment, and of maintaining the integrity of the original property and going concern values. Success is now measured more than ever by this one standard. Conservation of capital for owners and creditors is the primary responsibility of management.

Protection of the Investment.—Out of his long experience in the battles of survival in the business community, the successful business man has evolved certain financial norms which he dare not transgress, lest he pay the supreme penalty in the loss of his business investment and his credit standing. The outstanding problem of management in protecting the investment ultimately is the control over solvency; therefore, the most important study centers around those conditions that have a direct and immediate effect in reducing the debt paying capacity of a concern.

Hence it might appear that the problem has come to be, not how much of annual profits can be made from period to period, but how may the enterprise be conducted so as to avoid almost certain annihilation from the disintegrating forces that attack business and reduce its solvency position to zero.

What are these destructive forces that attack business concerns and make the investment hazard so great? First, there are a series of internal factors, such as: (a) insufficient capital investment on the part of the owner, considering the scope of his attempted operations; (b) the wrong method of financing fixed, working, and trading assets; (c) the diminishing of working capital through the use of current assets and current liabilities for paying heavy dividends; (d) poor buying policies that cause over-extensions in the investment in merchandise inventory; (e) lack of sales volume, resulting in operating losses, which tend to cause insolvency through the dissipation of working capital; (f) poor credit and collection policies, which result in over-investment in trade accounts; (g) general inefficiency in factory methods, which results in wastes in processing, etc., and general operating losses; (h) lack of proper policies for reinvesting and conserving the profits of the business; (i) failure to provide ways and means for replacing the assets that wear out through depreciation and obsolescence, through the passage of time and the expiration of legal tenure.

Second, there are a series of external factors, in many instances beyond the control of the business man, such as: (a) adverse legislation, public opinion, changing styles, etc.; (b) changing conditions brought about by the adverse factors found in the business cycle, which accentuate the difficulties

in buying, selling, credits, collections, etc., and center in the one larger problem of solvency; (c) physical hazards common to all business enterprises, which can be forecast with only a degree of certainty, such as the destruction of property by the elements, by fire, etc.

Modern Delegation of Authority and Absentee Ownership.—The time has long passed since owners of business concerns could guide their affairs without delegating important administrative and even executive functions to subordinates, to whom they must now look for the successful discharge of the true entrepreneurship function. Absentee ownership as represented in the corporate form of organization, and delegated authority as found in the institution of branch factory production and distribution agencies, has passed the direction of business out of the realm of personal supervision, into the realm of line and staff organization, and has ushered in the age of mechanical control technique.

A few short decades ago, ownership was expressed in the single proprietorship, or perhaps the partnership, and direction of enterprise was expressed in the personal relationship of master and journeyman found in handicraft or small factory production methods. Today entrepreneurship has been dissipated into forms whose ownership function is a matter of mere definition.[1] Title to corporate stock is often disseminated over the entire country and even over the world. Direction today has been reduced to legalized majority rule as expressed in the authority of boards of trustees.

The personal directing of business enterprise found in the nineteenth century has given way to standard definitions of performance for subordinate officers and even labor groups, contained in record books. Incentives that formerly existed in the fact of individual ownership of the means of production, and the identification of the individual producer with his product, now are supplied through personnel work, bonus and wage plans, the objects of which are to induce an "organization" loyalty and to overcome the anonymity of production. The worker has lost his identification in the mechanism of wealth creation. His effort in wealth creation is anonymous; discipline that formerly was self-imposed, today is superimposed from without at the instance of management.

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[1] For example, some of the present day forms of debenture stocks and bonds, non-voting stock.

Efficient control is being reduced more and more to a matter of measures and records.

As ownership has become widely diffused among scores of owners who have relinquished control to responsible directors, so there is an ever-increasing demand for standard accounting and statistical reports, which show the status of the business concern entrusted to the directorate.

As management has become a matter of mechanical control over complicated mechanical processes of widely scattered producing and distributive units, so there is an ever-increasing demand for standard accounting and statistical reports that show the performance of those to whom functional responsibility has been delegated.

The Auditing Viewpoint and the Management Viewpoint in Accounting.—Much of the literature today on the subject of accounting has been written from the "auditor's" viewpoint, with the purpose in the main of developing a technique that leads to the correct formulation, in one or more aspects, of the financial condition of a business. Practically all of the theory of valuation of accounts, the definitions, the classification of accounts, the accounting procedure, and bookkeeping technique, center around this one problem. Written primarily for the practicing accountant, the public and private auditor, and for the candidate for the degree of Certified Public Accountant, the literature has aimed at the development of rules and procedure, for conducting various types of audits, special investigations, for the installation of accounting systems, and for the purchase and issue of securities.

The Detailed Audit.—The most profound and comprehensive efforts of the more recent writers along these lines have aimed at the formulation of theories and conventions which it is hoped in time will be reduced to standard practice, for use in the detailed audit, a service that finds the accountant at his best. The greatest expression of this handiwork may be found in the reports that reflect control over the correctness of accounting data and of the routine accuracy in the accounting department.

These certified interpreted reports are indispensable to management and owners because of the guaranty that they reflect precision and accuracy in the recorded data. Likewise, they are of inestimable value to credit departments in the formulation of judgments bearing on the application of credit extension, because of the confidence they create in the dependableness of the data submitted by the applicant. The investor in securities, the prospective buyer of business concerns, in fact all others who occupy a lay position, because of lack of intimate contact with the accounting records, in a similar way are dependent to a large extent, in planning lines of action, upon the integrity of certified reports.

The position of the professional accountant is well established in the business community today, thanks to its ever-improving standard of proficiency, and to the increased understanding of the quality of service which the accountant renders.

Accounting a Service to Management.—But the question may be raised: Do such services, as useful as they undoubtedly are for the purpose of checking accounting accuracy, supply to management the needed information for a well-rounded system of checks and balances for the guidance of the business as a whole? Are they sufficiently analytical and constructive in character to answer the questions daily propounded to management covering the formulation of broad administrative policies; for defining standards and measurements with which to check the work of administrative officers; for checking performance after the standards have been defined; for planning and executing budgets; for determining specific causes for losses in departments and devising remedies for the faulty conditions; for determining who are the especially active administrative officers responsible for the business progress of the concern?

When comparing the purely financial reports, the essential difference in the viewpoint of the "auditor" and the "management," may be viewed in contrast. The auditor tends to look at the accounting reports as correct statements of financial and operating conditions; the manager stresses these reports as aids to control over financial solvency and operating proficiency. To the former the primary problem is content—that of showing the correct valuation of assets and liabilities and correct categories of operating data; to the latter the major problem, in addition to showing correct values, is the use of reports that aid in the protection of the investment of a successful going concern. The control accountant is interested in financial reports that feature tendencies, good or bad, in operating conditions, and in the financial structure of the business for which management is held responsible. He wants a dynamic vital story of performance; answers to specific problems of improved control and better control technique.

The typical approach to the manager's problems of control cannot follow the highly conventionalized practice of cataloging all quantitative facts in either one or two categories; first, those data that affect the balance sheet, and second, those data that affect the profit and loss statement. While it is true that all business facts as recorded by the bookkeeper find their way at the closing date into one or the other of these financial statements, it is also noteworthy that the business executive does not classify his problems in this elementary manner. A business is a rapidly changing complex thing, and the executive does not and cannot attack his problems with the sole idea of a solution that leads only to a correct showing of, (1) financial condition facts, and (2) expense and gain facts.

What business needs are reports that give a more complete analysis of the performance of managers; reports that furnish data upon which future operations can be based; reports that aid in preplanning and checking operations; reports that give a *modus operandi* for locating losses and devising remedies therefor.

Correct valuation principles, and classification of accounts are highly necessary, but of more importance is a knowledge and use of reports that give a greater control over the solvency and the security of the invested capital.

Accounting and Statistics.—Due to the fact of the limited type of engagements on the part of clients which restrict the work of the accountant, many auditors are unable to go beyond the usual inspection work. Thus not a few report writers are unable to make use of what might be called "the purely statistical facts of business," in making up their statements. Other auditors consider statistics for the most part of secondary importance, and fail to take note of these outside data and leave the client to secure them from his own staff.

Some bookkeepers and accountants, and their number fortunately is steadily becoming less, largely because of the long history of the profession, are reluctant to alter their position and viewpoint, and broaden their scope of operations sufficiently to enable them to render the service that proprietors have a right to expect. To these few accountants the "managerial-statistical" aspect of report writing is beyond the function of the keeper of the records, and since the figures do not fall within the scope of the trial balance, they are deemed of secondary importance, if not to be ignored altogether. No brief can successfully be held for such a demarcation between accounting and statistical services. It is unfortunate that they are thus viewed, and largely because of the approach as separate sciences, having a somewhat different methodology and historical approach.

All Business Activities Covered by Control Data.—To the executive and owner, the accounting reports as now constructed and interpreted, are merely aids to the larger field of statistical technique which are used in the broad, general field of quantitative pecuniary interpretation, the subject matter of which extends all the way from financial condition facts, income and expense facts, to internal administrative facts, to labor productivity facts, machine rate facts, idle time facts, cost facts, buying and selling facts, advertising productivity facts, credits and collections facts, working capital conservation facts, price control facts, and scores of other facts that cover management problems.

How much more important is it that the auditing department, or some other measuring department, should supply all the important business data that reflect bad tendencies and unprofitable lines of action, and furnish the "alarms" in business conditions, internal and external, that warn the owner that the road ahead contains hazards which will bring his undoing.

In short, all of the general statistical information of a business, be it the result of special research or compiled from ledgers, is grist to the mill of management. Neither accounting nor statistics are primary; both are necessary to complete report writing. It makes no difference whether these reports come from financial statements, or from the cost sheets of the shop and factory, or from the questionnaires received from the trade. Vital, living business data are wanted, not alone accounting reports, but every report apropos of the present financial and economic status of the business and its position in the business community.

Need for Management Viewpoint.—The statistician or financial engineer must of necessity assume the active interest and approach of the manager in making his reports. He should be well informed in the "shop" of the business in which he expects to report, and should have a thorough grasp, from first-hand sources, of all the control problems confronting the manager upon which a quantitative analysis is wanted. In short, his reports should answer all the problems presented for executive or administrative action, that have a pecuniary interpretation.

Much of the work of such an expert will of necessity be of an educational nature, as there is at the present time a lack of understanding of the principles of accounting and statistical interpretation and presentation. The use of better administrative and executive reports, incidentally, will lead to a better understanding of the finer points of classifications and definitions of accounts that now seem so stilted and academic to the practical business executive.

Cooperation of Subordinates Secured by Reports.—As accounting reports come to be used for the purpose of standardizing the requirements of managers and subordinates, and to measure their performance, a closer scrutiny of the content and general form of the reports will be made by those parties directly interested in them. If a works manager's labor report shows poorer performance this year compared with last year, he will naturally inquire into the method, technique, and theory by which performance is being checked. If the sales manager is told that his performance is below par, he will immediately inquire, "By what authority?" If he is told that his indirect expenses indicate the cause of the difficulty, he will again inquire into the definition and content of the accounts and the construction of the system that is being used as a guide to management in his particular field.

Thus, it may seem that a changed viewpoint is necessary on the part of the many writers, who are directing thought along accounting and statistical lines; also on the part of business men who tend to view accounting as a "foreign" language. But more particularly is there need of a new viewpoint on the part of the practicing accountant upon whom the burden of education must naturally fall.

The Accountant a Business Adviser.—The accountant must first appreciate the fact that his greatest responsibility to the business community is not primarily that of expanded police power, in detecting and proving fraud, etc., but of constructive financial advisorship. Misappropriation, misrepresentation and dereliction of fiscal duty must be detected, and only the expert accountant is qualified for this work. But this part of the accountant's work constitutes a small portion of the potential field of useful service open to the profession.

Control Reports Aid in Checking Business Failures.—Fuller accounting and statistical information concerning the operation of the plant as a whole, should afford a ready means for checking unit and group costs so as to stop effectively much predatory price cutting between competitors whose calculations covering costs of production and marketing may be inadequate or misleading. Many disastrous rate wars have been conducted between rivals, and ultimate ruin brought to the price cutter and also to the firms that were forced to meet such competition, through the fact that selling prices were set at a point below profitable figures for all parties concerned. In many such cases of abortive efforts to attract trade away from rivals through price and service wars, systems of control data would tend to check the evil. The practice of price cutting would have a much shorter life if accounting staffs would charge themselves with the task of placing before the proper authorities, in a simple form and in understandable language, all the patent facts regarding the current changes in financial, operating, and budgetary conditions that are vital to progress.

It is, therefore, highly important that a more scientific approach to statistical guidance to business conduct be not only devised but also put into effect, to the end that greater improvement be brought to competitive as well as non-competitive lines of business. Losses running into hundreds of millions annually, caused by the failure of firms whose demise was brought about by lack of experience, inefficiency, and other similar causes, can be saved to a considerable degree through a better understanding and use of improved control records.

Control Reports Useful for Credit Purposes.—In assuming the viewpoint of management in the approach to accounting and statistical control, it must be remembered that many of the reports used for internal control purposes by executives can be used by credit departments in analyzing credit status, by underwriters and prospective and present owners of securities in analyzing investment values; also by prospective purchasers of business concerns for the purpose of analyzing past conditions more completely. In fact, more accurate, analytical information placed in the hands of all parties interested in business, will lead to sounder judgments in initiating and carrying out lines of action in all financial matters.

CHAPTER II

CONTROL OVER BUSINESS THROUGH STANDARDS AND MEASUREMENTS

Trends in Statistics and Accounting.—The conventional double-entry scheme of recording business data, with its plan of narrative financial reports, was one of the most useful systems devised up to the time of its adoption for controlling and presenting financial data. It superseded a former conventionalized plan of historical reporting by means of the single-entry statement of affairs. Both plans operating today are being seriously amended by a new plan of "standard accounting" and "budgetary control," which is altering existing statistical and accounting methods and presentation in a noteworthy manner.

Single- and Double-Entry Bookkeeping Systems.—Single entry sufficed for the needs of simple financial arrangements that accompanied early elemental merchandising. With the introduction of more complex financial arrangements, brought about by aggregated capital, the employment of involved industrial and commercial processes, which required more exactness in measurements, an improved system of accounting came forth to supply the need in the form of double-entry bookkeeping. It was invented primarily in response to the demand for control over accounting information and the direct control which this gave over commercial operations; but especially was it invented for control over those individuals directly charged with financial responsibilities. Just as single-entry bookkeeping failed to carry the load demanded of it as a mathematical recording device, being incapable of mathematical check and

proof, and gave way to the improved double-entry system susceptible of internal checks, so the latter is giving way to an improved technique, capable of greater control facilities for internal managerial use.

Modern Specialization in Measuring Devices.—With the coming of twentieth century mass production, the growth of consolidations and mergers, the intensification of competition, the growth of the labor problem, and latterly with the exigencies of the World War, came a change in managerial problems. Personal supervision gave way, as previously stated, to delegated authority and "mechanical" controls, more nearly suited to the needs of this highly complex production machine.

As business expanded and gave impetus to the division of labor and specialization in production, marketing, and finance, there arose a like specialization and division of labor in the field of management and in the use of the governmental agencies employed in business, especially those involving records and measurements. Regulation over the separate activities in a given institution has developed a separate recording and checking technique, with the result that the controls formerly existing in the double-entry accounting systems as such, are now found in statistical fields remote from the older field of accounting.[1]

Ultimate control over the dynamic elements of cost and income variations is speedily being taken over by refined systems of internal checks and balances, with methods that appear to have only an attenuated relationship to accounting, but which nevertheless are the very essence of control mechanics. One has only to note the new type of reports covering "Variations from Standard Costs Caused by Inefficiencies of Operators, by Processes, Departments, and Individual Operators"; "Variations in Standard Material Costs, by Processes, Departments, and the Plant as a Whole"; "Costs of Idle Time Factors"; "Sales Budgets"; "Trends in Financial Structural Conditions," etc., to find this progressive element in financial reporting.

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[1] Note, for example, the separate internal controls over cash, customer accounts, all types of debts, material inventories, payroll, factory operations, branch plants, sales budgets, etc.

Thus, change is coming into the field of accountancy and is bringing important alterations in viewpoint, methods, and technique; in response to the inquiry as to whether or not the profession is rendering full service to management in its ever broadening field of control.

The Accountant a Staff Member.—The modern accountant is figuratively leaving the office to a greater extent than ever before, and is taking up a roving commission that finds him in the shop, the factory, the selling, and finance fields. He is working as a staff member with the engineer, the production superintendent, the gang bosses, the repair bosses, the sales manager, the office manager, the finance manager, the credit manager—devising new measuring units in the various functional fields of industry and trade. The obvious purpose of this enlarged commission is to facilitate internal business supervision.

The Function of Standards.—Progress at all times is determinable only by the process of comparison. Present performances are pronounced good or bad accordingly as they show positive or negative results, contrasted with a given set of conditions that are accepted as standard. Without these contrasts no comprehensive measure of success or failure is possible. For example, costs are improving if they are less, relatively, this period than last; sales are improving if they show a greater volume this period than last period; the debt-paying capacity of a firm is improving if the liquidity ratio shows a progressive change from a given point, or from a theoretical norm.

Much misinformation exists regarding the use of the term "standard" and its function in the regulation of business conduct. "Standards" have existed from the earliest times as guides to all types of pecuniary valuations. Used formally or by implication, they furnished the norms against which processes, procedures, prices, profits, rates of payment, discharge of managerial responsibilities, etc., have been compared for appraisal. Thus we have had standard nomenclature, standard forms for statistical statements, standard ledger account classification, standard ratios of significant operating values, standard machine hourly rates, standard labor operator time, standard material costs and specifications, standard power rates, standard fuel costs, and so on for an infinite variety of factors.

Scientific Standards.—The point of difference between the modern emphasis on the construction of standards and the old is one of derivation. Science demands to know if the norm which has been accepted as a guide in any given case has been derived empirically, from mere rule of thumb, conventional practice, or whether it has been assayed in the laboratory and subjected to the acid test of precise measurements.

Much of standard performance data that have been accepted in the past by accountants and statisticians, have been of the empirical type, largely based upon past operations which had never been assayed by scientific processes. In most cases this type of standard, if indeed it could be called a standard in a modern sense, was the only available means at hand for comparing the current results.

But the value of costs and financial facts is limited unless such statistical information can be compared to an acceptable standard measurement; otherwise the reports are merely histories, since "they are measured against nothing trustworthy." A comparison of this year's selling expenses with last year's may be good factual material, but it is of no particular value for control purposes if the former statement may not represent best performance. In short, such a process may simply resolve itself into a comparison of incompetency with incompetency.

The lack of suitable standards applies today to practically all the fields in which accounting is used for report purposes—in the shop, the office, the market, and in finance.

The Department of Standards and Measurements.—In every business institution there should be installed a department of standards and measurements, incorporated as the accounting department, statistical department, or comptroller department, whose duty it should be—(1) to construct standards of measurement wherever needed in the business organization for control purposes; and (2) to establish records that will adequately measure performance in terms of these predetermined standards.

Standards should be constructed in all departments and made applicable to all operations of the business—accounting, statistics, buying, selling, transportation, production, credits, collections, finance, etc.—in order to have a distinctive third-party viewpoint in definitions and findings, and also in order that the report forms may be used advantageously by all the departments involved in correlated operations.

The standards and measurements should be functionalized in accordance with the functionalization of operations. Successful business organizations are built by selecting efficient executives and holding them responsible for the successful operation of their departments. Every important operation in a fully organized business normally has a responsible "functional" officer in charge. The reports covering the departments should be built around such an officer and made to reflect the complete performance of this executive. But first, workable standards should be devised by which success or non-success in performance can be measured, a condition which necessitates the closest scrutiny of the physical plant conditions and an intimate knowledge of all the personnel and organization factors.

Types of Standards and Measurements.—In such an organization, the department of standards and measurements as outlined, it will be found necessary to have various types of standards, such as the following:

1. Accounting Standards
2. Financial Standards
3. Physical Standards

Accounting Standards.—These guarantee, within the limits of sound judgment, that the facts presented in the financial reports can be relied upon for formulating lines of action. Such standards govern the method of handling all financial facts that appear in any of the summarized reports, such as the balance sheet, profit and loss statement, or the cost of manufacturing statement. Since management must be assured that these final reports are accurate and consistent in content, one year with another, it is necessary that standard accounting practice be introduced into the field. Standard accounting practice, for example, assures the reader of a balance sheet that net investment by the owners is properly stated, that profits as reported have been earned, that the assets and liabilities are properly valued and are held under defined property rights, etc. It also assumes adequate internal checks that guarantee routine accounting accuracy.[2]

The principal accounting standards are: nomenclature, form, procedure, classification of accounts, valuation.

Standard nomenclature in accounting has been gaining ground in recent years through the instrumentality of the Federal Income Tax Department's advocacy of the use of common terms broadly used in the United States. Such terms as trade debtors, trade creditors, balance sheet, profit and loss statement, prime costs, factory burden, current assets, funded debt, etc., are coming to be standard accounting terms with definite meaning to laymen and professionals alike.

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[2] The treatment of standards in this text assumes that the reader is familiar with the elementary principles of accounting.

Standard forms of financial statements may be divided into two classes, viz., external forms and internal forms. The former type is representative of the usual balance sheet, profit and loss statement, and manufacturing cost statements used broadly for general credit purposes; also for the issuance of securities by underwriters and investment houses; for reports to stockholders; for the purchase and sale of business enterprises, etc. In the credit field, the Federal Reserve Board, the Federal Trade Commission, and the Certified Public Accountants have made a notable contribution in standardizing statement forms. A model form of "credit" balance sheet advocated by the Federal Reserve Board is shown in Chapter III, page 40. The details of form and the sequence of items in order of their liquidity, tend to vary with the expressed object of the issuance of statements.

Internal forms of accounting statements include such exhibits as may be used for the managerial control of business operations. The more common ones are the "functional" and comparative balance sheet, the statistical forms of cost reports, profit and loss statements, unit (i.e., physical) statistical reports, efficiency reports, standard cost reports, budgets, market analyses, etc. These are occasionally used for external purposes, such as for credit utilization. They often add valuable information not found in the external forms. The growth of the internal reports is indicative of the expansion of the work of the modern scientific management movement, as expressed in the broader field covered by comptrollers, statisticians, and industrial accountants.

Procedure outlines the accounting system and provides the details of routing data through the established records. It provides for the internal checks required in large-scale accounting systems, necessary to procure a proper check on incoming and outgoing values.

Standard classification of accounts varies with the purpose of the grouping. The one most commonly used divides all accounts in the ledger into (1) nominal accounts—those representative of the income and expense group; (2) real accounts —those representative of the property, debts, and ownership group.

Valuation standards guarantee, within reasonable limits of judgment, that the financial and operating categories are correctly "priced." A balance sheet constructed according to standard valuation principles shows, when certified, that all of the assets are held under the ownership titles indicated and that the property items have been appraised according to accepted scientific principles and are true to the name and types (nomenclature) appearing in the report. It indicates that all debts of the firm have been listed, and are represented at their true value and in accordance with the legal status of the creditors' liens. Valuation standards likewise guarantee that proper classification of accounts between capital and revenue expenditures have been made, the conditions implied in the "pricing" process.

Financial Standards.—These standards are sign posts that have been constructed out of past operating and financial experience, for guiding current operations. They express certain financial relationships, in ratios, trends, turnovers, etc., which have registered past success or failure in financial conditions; they furnish the norms that management is attempting to approximate or improve in present current operations. A few types of financial standards may be mentioned in passing, for example: the ratio of net earnings to capital invested; the ratio of sales to plant values; the turnover of merchandise inventory; the turnover of accounts receivable; the per cent of sales outstanding in accounts receivable; the per cent of raw materials inventory to total purchases; the average age of delinquent accounts, etc. Other significant financial standard types will be used for illustrative purposes later in the text. The purpose of such standards is to control the financial resources for the best advantage of the firm.[3]

Physical Standards.—Physical standards form the starting point in the control of financial operations. They measure physical facts that are finally registered as pecuniary facts. Examples of physical standards used for control are: standard labor performance, standard machine performance, standard hourly or daily output of store clerks, billing clerks, journal clerks, etc. Such standards tend to define a dollar's worth of service as a factor in cost control.

Physical standards have reached the highest point of perfection in factory practice. Control over costs of production received first consideration at the hands of the "management" engineers. It was in the shop that attention was directed to the problem of reducing industrial waste. The plan of attack consisted, first, in the construction of operating standards expressed in terms of operating efficiencies, which gave a physical norm for plant running conditions. These standards were expressed in "procedures," or standard ways of doing things.

The statistical accounting standards were built upon data obtained from the standard plant procedures, and were expressed in terms of the limits of economical performance, that is, efficient practice at least cost. The physical operating standards practically gave meaning to the standard accounting practice. The object of the entire plan was "the regulation of the controllable items of expense on the basis of a set production program, with the object in view of eliminating unnecessary or wasteful expenditures and reducing necessary expenditures to an economical minimum"[4]—in short, maximum production at a minimum of outlay.

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[3] Chapters III to XIII are devoted to a discussion of financial standards.

[4] Perkins, industrial engineer, Chrysler Corporation, quoted in American Management Association Bulletin, Annual Convention Series No. 51, page 50.

Physical Standards Applied to Production.—In production plants the engineer prescribed through a planning department the most efficient plant layout (general factory plant and equipment plan); the most scientific routing process (control over the sequence of work together with working instructions to operators); the most efficient handling and control over materials (sequence of materials movements and provision of required quantities based on preplanned operating schedules); the best time and least motion required to perform physical operations in which equipment, plant factors, and human dexterity were involved. He worked out the best system for the selection of workers and the rewards required to secure and hold personnel goodwill and sustained production effort; the most economical methods of power generation and transmission; the most economical purchasing of materials and supplies on the basis of specifications and laboratory tests. He also planned the execution of advertising and selling campaigns based on market research and publicity methods. In short, the industrial engineer has worked for the perfect correlation of sales quotas, production quotas, and the provision of all facilities needed for a well-synchronized system of manufacture and distribution of goods.[5]

Thus the engineer carried scientific research into every field that contributed directly or indirectly to the making of profits. Wherever pecuniary outlay was involved, inquiry was directed into the modes employed to reach desired goals. The guiding factor was the measurement of the economic cost and the specific productivity of the factors involved in the rendering of service.

Out of all this research grew a system of scientifically derived operating standards, devoid of tradition and conventions as the first means of eliminating unnecessary wastes within a given plant and guaranteeing the economical use of all cost factors.

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[5] In the broader field of business enterprise, scientific management has applied its general laboratory methods to such problems as the localization of industries in general; the location of plants within a given industry in the most strategic spot favorable to the use of raw materials, power, labor supplies, credit facilities, markets, transportation, in addition to the specialized plant problems of planning, routing, stores, and so forth.

In this "battle against waste waged by science," most of the older traditional practices of production technique were subjected to deliberate laboratory tests by the engineer, who, spurred on by the demand of competition for lower production costs, insisted that those in charge "show cause" why machinery, equipment, and processes should not be subjected to the acid test of efficiency in its highest form, as a right to continue as elements of economic production.

Pragmatically the standardization and systematization of production, administration, and marketing technique was undertaken as a means of carrying analysis to a point previously untouched by the then existing systems of managerial controls and statistical analyses.

With the introduction of science into the conduct of business, there naturally came a new emphasis in accounting and statistical methodology, not essentially antagonistic to the older practice, but modifying it to the extent of making it amenable to the greater needs placed upon it through a change in the arrangement of the value data measured and recorded. Cost accounting was the first measuring tool seized upon for the purpose of accurately assaying the then current practice, and in formulating corrected standards as guides for the planning and production departments.

With the construction of standard layouts, routing, order of work, speeds, feeds, material quantities and qualities, wage rates, etc., came "standard" costs for all of the plant processes. Standardization in production procedure has come to mean the best manufacturing practice obtainable in a given plant. Modern standard costs measure the "least cost" required to pass a given product through the plant on the basis of these predetermined standard production procedures.

Standards Applied to the Administrative Field.—The broader conception of the use of standards and measures has placed a final emphasis on the "secondary" or managerial statistics of a business that make them "primary" in locating losses. The cost accountant and the general accountant, upon whom management has relied in the past for isolating loss factors, now find a need for substantially remodeling their plan of procedure by joining forces with the research department in devising a new reporting plan, the measuring units of which are expressive of the shop, administrative, and selling standards and performances. Thus conceived, the accountant joins the managerial staff as the "comptroller" of all procedures. He becomes the custodian of all records of costs, and has access to all detailed control data covering the measurements of technical and administrative process. All measurements upon which planning depends are his responsibilities.

Absolute and Comparative Standards.—Absolute or par-in-performance standards represent perfect attainment. Such standards may be secured from reports of other like plants, or from the averages of the industry as a whole. They are often procurable from trade association reports. In these instances the absolute standards are superimposed from without and are adopted as par in a given institution. Or again, these absolute standards may be devised for a plant as a result of previous experience or by pace setting, time study, and motion study. The standard output for machine No. 8 for example, as secured in other plants, or by time study, may be 1,000 units per eight-hour day. This absolute output is the physical standard that the machine operator strives to attain in his daily work. Or again, the financial ratio of current assets to current liabilities of a particular type of business concern, should be 4 to 1, a ratio that management ever strives to reach and maintain.

In many instances it is impossible to secure a reliable standard that might be accepted as par performance either from external or internal sources. Comparative reports may then be used as a standard device to determine the fact whether progress is being made from a given point. Since improvement in operations is the desideratum, the comparative report will register the fact whether gains or losses are being made in various activities. For example, this month's or this year's labor cost may be checked with last month's or last year's labor cost, or the machine's hourly costs this period against last period. All such reports tend to give a decided direction to and a noteworthy measure of control over all productive and administrative effort.

The standards and the performance reports should be so constructed that they are readily understood by those parties who use them. They must of necessity be accurate in results, yet adaptable to changes in the institutional and personnel factors found in the plant.

Accounting Standards and Future Values.—In another way, standard costs aid business men in discounting future conditions more successfully. Contracts for the sale of merchandise are made on the basis of future deliveries. Goods made for the market are very often produced several months in advance of the actual sale of the merchandise. Business has always been a matter of dealing in future values, and any system that provides a means of more accurately forecasting operating costs and other expenses of doing business, makes a distinct contribution to the important service of lessening business risks inherent in the making of future commitments.

Standard costs of production enable the manufacturer to forecast his costs more accurately than under a system of accounting that gives a history only of costs after goods are produced. The same is true of the merchandiser who operates a budget plan, based on standard merchandising expenses by departments or lines of goods.

The use of standard costs enables the comptroller to discount future conditions in harmony with the needs of the sales, production, and finance departments, which must at all times look into the future in planning operations. In many instances accounting departments lend no assistance in furnishing data on probable future costs and expenses, because the system of records in force does not, and cannot report on costs until after operations are closed. Past cost conditions are often poor criteria of what the future conditions will be. The automobile manufacturer who announces the prices of models months in advance of actual production and sale, illustrates the need of predetermined costs for planning future operations.

Incidentally, in plants where selling prices, based on standard costs, are set in advance, an incentive is furnished to the production department to turn out the goods at the advance cost figure. Results are watched with a considerable degree of interest where tests of manufacturing efficiency are made on the basis of predetermined costs.

The Standard Function of Budgets.—A budget forms a super-standard or regulator of all functional operations. It is, in fact, a grouping of the standard expectancies of all business activities placed in a summarized statement. It is a standard, then, in the sense that it furnishes the norms or predetermined performance, and gives the report on the actual work done in all departments. In the capacity of forecaster it aids in appraising the work of each functional officer and sub-executive who has line authority over various sales activities, such as sales research, advertising and sales expenses. Its correlating or governing function is obvious. It "standardizes" all activities, and records the results, thereby furnishing a ready check upon all departments. It furnishes the incentive for securing the cooperative effort of department heads in their common work of securing efficient production and distribution at the least cost in response to the demand for goods created by the sales department, financed by the finance department.

The Functions of the Comptroller.—Because of the complexity and number of standards employed in business control, there is need for the employment of some central agency for correlating all of the accounting and statistical data that make up standards and records, in order to ascertain whether or not all results measure up to standard requirements. This demands the maintenance of a central recording agency, usually placed under the line authority of a comptroller, whose immediate responsibilities are: (1) the codification of statistical procedure, (2) the definition of all standards, (3) the assembling of data that measure the results of all group and subgroup activities, (4) the judicial weighing of performance in light of the standard requirements, (5) the making of executive reports covering critical elements that are "out of line" compared with standards, and (6) the making of specific recommendations for managerial action aimed at the eradication of imperfections in technique, in physical procedures, and personnel management.

In the broadest sense the comptroller is a research engineer. His tools are accounting and statistics, the mechanics of comparison; his field, the entire scope of internal and external business problems that are reducible to mathematical measurements and are of sufficient importance to demand managerial attention.

Functional Officers Aid in Constructing Standards.—In the work of constructing physical, shop, office, selling, and financial standards, the comptroller is naturally aided to a great extent by the functional officers whose departments and activities are being measured. In factory measurements, involving mechanical, electrical, and chemical processes, the engineering staff virtually assumes the active work of systematization and rate setting. Qualities, quantities, rates, and other significant indices that form the basis of cost criteria are formulated by them. Time rates, speeds, feeds, wage rates, etc., are furnished by those functional officers, under whose authority these activities are placed. Speed bosses and engineers cooperate with the comptroller in working out the measuring units that will give the best expression to the operating facts.

The gathering of the shop "performance" data is often entrusted as a special work to the cost accounting division. The daily records of equipment processing rates and of labor productivity, are likewise secured by the cost division of the accounting department.

But it should be noted that the function of the comptroller is essentially a "deputy on missions"; he assembles the data that show the results of planning and production. He is the reporter on efficiency, not the general manager; nor is he the shop or office disciplinarian. He receives the active cooperation of all departments in the work of reporting, and assists the operating heads in analyzing difficulties and in carrying remedial measures to the correct source.

It should be noted in passing that no system of records is in any way a substitute for organization or system. It is a facilitating device for the improvement of system.

Financial Measurements.—Probably the most important standard measurements with which the comptroller is concerned are those used to analyze the broad responsibilities of the financial manager. Such measurements are: (1) those that reflect the status of the debt-paying capacity of the firm; (2) the existence of faulty financial structural conditions due to imperfect methods of capital financing; (3) the conservation of working capital; (4) the tendency to the accumulation of general financial stresses and strains within the structure caused by operating conditions; (5) the tendency to the over-extension of particular departments of the business, such as the trading or the producing department, out of proportion to their expected work; (6) the accumulation of frozen assets, such as trade accounts, inventories, excess plant investments, etc.; (7) the protection given to the concern by the surplus and proprietorship reserves; (8) the protection of the investment that exists in the conditions represented by the valuation reserves and secret reserves; (9) the computation of the working capital requirements of a newly projected firm and of a going concern; (10) the productivity of the plant assets and the owner's investment.

It might be said that many of these standards exceed in importance the measures of operating efficiency. Without a sound financial structure, successful operations are impossible of attainment. The comptroller's responsibility in furnishing to management all of the comprehensive information that expresses these broader financial arrangements and relationships, goes to the very question of the survival of the concern. In this capacity he brings up for critical review all the weaknesses in these financial factors, and displays for the owners, credit departments and bankers, all of the devices that are being used to improve the investment position of all equity holders.

The financial manager, then, may be likened to an engineer in charge of an intricate financial structure. He should be in a position to scientifically attack his problems successfully and not be obliged to experiment on the basis of trial and error, in order to solve all financial problems. The comptroller aids materially in this work by supplying scientific standards for all financial operations.

The importance of the financial standards and records is sufficient to warrant first place in any treatise on accounting control; hence, they have been placed first in this text, under the heading of controls exercised through the use of balance sheets.

The second half of the work is devoted to operating measurements.

CHAPTER III

CONTROL OVER SOLVENCY—FISCAL BALANCE SHEETS

Hazard of Over-Expansion on the Owner's Equity.—Since the violation of financial laws leads ultimately to insolvency and bankruptcy, the acute problem of financial management in protecting the investment is that of meeting all debts when they fall due. In reality all other problems are of secondary importance to this one problem, just as all functions of a commercial bank are secondary to that of meeting demand obligations promptly. A high degree of control may be exercised by analyzing the immediate conditions that contributed to the conditions of insolvency.

One of the most prolific causes of financial disaster is the over-expansion of the volume of business on a limited amount of capital invested by the owner. Many business men find themselves in serious difficulty for the first time when they discover that their investment is wholly inadequate for the scope of operations necessary to produce a satisfactory net income. Again, serious trouble arises when the attempt is made to enlarge the volume of business or to expand the size of the old plant, without a sizable increase of the inside equity.

Ratio of Inside to Outside Equities.—A proper ratio of inside equities to outside equities in the business as a whole is one of the prime requisites in maintaining control over financial solvency.

A concern that has an inadequate foundation of inside investment upon which the superstructure of credit is to be raised, is structurally defective in the first instance, and cannot hope to survive. In short, it does not have an opportunity of properly functioning as a business unit.

There are several important reasons why business men tend to over-expand operations through the use of too great an amount of credit, the most important being the dynamic factor of "trading on the inside or owner's equity."[1] It explains the tendency toward "shoe-string" financing methods so prev-

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[1] Trading on the owner's equity explains in large part the causes of real estate booms, public participation in the stock market operations and more particularly, the use of short-time and long-time credit for business purposes. An example will clear up the point:

A man has $10,000 on which he earns, let us say, 20% net, or $2,000 per year. By borrowing an additional $10,000, on which he again may earn 20%, his total income is increased to $4,000. The interest charge on the borrowed $10,000 at 6% will cost him $600, leaving net $1,400 for his borrowed capital. An increase is thus made in his net income to $3,400 which raises the income figure from 20% to 34% on the invested capital.

If a second $10,000 is borrowed and makes something less than 20%, say 15%, on which 6% interest is paid, the total net earnings will be increased to $4,300, or 43% on the invested capital, an increase in the net income over the original figure of 115%.

The dynamic factor is the rapid progression made in the rate of increase in earnings made by borrowing money which costs a lesser amount than is earned by the same capital in business.

The balance sheet of such a client would be as follows:

Assets	$30,000
Outside equities	20,000
Inside equities	$10,000

The real danger in this case will come from two immediate sources: (1) the possible tying up of assets in an unliquid condition, such as frozen inventories, in slow accounts, or in the plant, making it impossible to pay debts at maturity; or (2) the lowering of the rate of earnings to a point that will make it impossible to earn the interest charges, a condition that inevitably will lead to bankruptcy.

If in the illustration above, the earnings in a series of bad years should decline to 3% on the capital employed, the income will amount to only $900, or $300 less than sufficient to cover the interest charges on the borrowed capital. If the earnings turn into a deficit on the capital, the loss increases at a progressive rate. A 10% loss on the total capital would amount to $3,000, or 2½ times the interest costs. If no borrowing were made in this latter instance, the loss would amount to only $1,000, or 10% of the owner's equity.

But where the firm has become over-extended by the borrowing of the $20,000, it will require only 3 1/3 years with a 10% loss to completely wipe out the entire investment of the owner, a condition, however, that probably would not be allowed to run to such extremes by most creditors and bankers. See Hastings Lyon, Corporation Finance, Chapter II.

alent in this country. Because of the shortage of investment capital, an attempt is frequently made to use credit in undue amounts without adequate protection in the form of a proper-sized capital investment.

Report Form Balance Sheet.—The report form balance sheet shown below and in Figure 1 features the strength of the foundation of the enterprise by showing this important fact. The following balance sheet will illustrate the point:

Current Assets	$ 75,000		
Fixed Assets	150,000		
Total Assets		$225,000	
Current Liabilities	$ 50,000		
Fixed Liabilities	90,000		
Total Liabilities or Outside Equities		140,000	62.2%
Net Worth or Inside Equity		$ 85,000	37.8%

Here the owners have invested $1.00 for every $1.647 invested by the creditors. The ratio indicates an "unfavorable" financial structural condition for the majority of cases. The pyramid of credit is inverted and has the general impression of topheaviness. Only 37.8% of the total investment is represented by the inside equity. The remaining 62.2% is the outside equity.

If the ratio of inside equities to outside equities were reversed in the above case so that the balance sheet registered the following facts,

Current Assets	$ 75,000		
Fixed Assets	150,000		
Total Assets		$225,000	
Current Liabilities	$ 15,000		
Fixed Liabilities	50,000		
Total Liabilities		65,000	28.88%
Net Worth		$160,000	71.12%

BALANCE SHEET

December 31, 1927

Rogue River Woolen
Mills Co.

ASSETS				
CURRENT ASSETS:				
Cash		$119,126.06		
Accounts Receivable	$ 63,492.58			
Less Reserve Bad Debts	2,918.62	60,573.96		
Inventories (Scheduled)		277,183.00		
Securities		1,000.00		
Total Current Assets			$457,883.02	
FIXED ASSETS:				
Buildings and Machinery	$341,378.14			
Less Reserve Depreciation	26,701.09	$314,677.05		
Workmen's Houses (net)		1,610.99		
Total Fixed Assets			316,288.04	
DEFERRED CHARGES:				
Prepaid Expenses (Scheduled)			5,969.37	
Total Assets			$780,140.43	
LIABILITIES				
CURRENT LIABILITIES:				
Notes Payable		$225,000.00		
Accounts Payable		313.45		
Total Current Liabilities			225,313.45	28.9%
NET WORTH			$554,826.98	71.1%
CAPITAL STOCK:				
Outstanding		$362,500.00		
SURPLUS:				
Balance, Jan. 1, 1927	$139,246.43			
Net Profit, Dec. 31, 1927	53,080.55	192,326.98	$554,826.98	

Figure 1. Report Form Balance Sheet of a Going Concern

Features: (1) Ratio of Inside Equities to Outside Equities. (2) Credit Report.

the position of the concern would be greatly improved because of the strengthening of the foundation. Trading on the equity, in the first case, has presumably gone too far, and has jeopardized not only the creditors', but also the owners' investment.

The correct ratio of ownership to borrowed capital is largely a question of individual cases, and is based somewhat on local conditions. It tends to vary with the type of business, the rapidity of turnover of the assets, the length of credit terms extended by wholesalers, and lastly, the ratio of the fixed or funded debt to the current debt. The personal factor naturally enters into the situation to a large extent in determining the safety ratio; an amount which through successful experience might be considered a safe ratio in one case, might be deemed unsafe in another case. The trend of the ratio is an important factor to note in checking financial structural conditions and in the standardization of financial ratios. If the trend of the ratio is tending to narrow down from say a 55-45 of inside to outside equities, respectively, to a 50-50 and 40-60 ratio respectively, the trend is unsafe and points to difficulties ahead for the financial engineer.

Ratio of Funded Debt to Current Debt.—A large superstructure of credit may be carried on the inside equity if precaution is observed in maintaining a proper equilibrium between the more volatile short-time credit and the long-time credit. If the business be one of stable earnings, unaffected by seasonal and cyclical changes, and if there be a high degree of control over the overhead expenses, the total volume of credit may be increased through the conversion of a portion of current liability to fixed liabilities.[2] Other factors remaining the same, a larger per cent of funded debts (mortgages and bonds) compared to current or unfunded debts, connotes strength rather than weakness. A balance sheet reflecting the liability position in Case I below, indicates a safer position for the owner than is found in Case II, assuming that the total credit load is not over-extended.

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[2] Called funding of current debts.

CASE I

Current Assets	$175,000	
Fixed Assets	275,000	
Total Assets		$450,000
Current Liabilities	$ 40,000	
Funded Debt	150,000	
Total Liabilities		190,000
Net Worth		$260,000

CASE II

Current Assets	$175,000	
Fixed Assets	275,000	
Total Assets		$450,000
Current Liabilities	$150,000	
Funded Debt	40,000	
Total Liabilities		190,000
Net Worth		$260,000

The larger funded debt in Case I places the maturity of the obligation into the future and relieves the current asset department of the immediate necessity of paying out cash to redeem short-time obligations. The necessity for carrying a relatively larger amount of fixed liabilities might be dictated by the fact of a slower turnover of current assets, coupled with short credit terms from wholesalers. Case II might be the instance of a faster turning current assets group, or longer wholesale credit terms. Safety from the hazard of the slowing down of the turnover of inventories and receivables or the quickening of the demand obligations would be found in a report that showed the funding of a portion of the current liabilities, or an increase in the ratio of inside to outside equities.

Standards for Measuring Debt-Paying Capacity.—As the superstructure of credit grows in dimensions based on the limited foundation of the inside equity, due to an increased volume of business, the question is raised as to how far the financial building can proceed without becoming over-extended in short-time commitments from wholesalers and bankers. In other words, an answer is demanded of the financial department for a ready means of determining from the financial statements the technique that will register the debt-paying capacity.

Turnover Rates and Solvency.—It must be readily understood that the ability to pay debts is dependent upon the amount of the current liquid property owned, and the rate at which it turns into cash in the ordinary course of business. The more rapidly the current assets turn into cash, the higher is the capacity for debt payment, and the less will be the amount of current property required for a given volume of business. A small but rapidly turning merchandise stock will carry a larger total volume of annual business than will a slow-turning merchandise stock. The credit needed for carrying the former necessarily will be smaller for a given volume of trade than where the turnover is slow.[8] One of the indices then of debt-paying capacity is "volatility" of merchandise stock and customer accounts.

But to properly check this debt-paying factor it will be necessary to take into account the amount of credit carried from wholesalers and its rate of turnover, i.e., the length of credit terms. If the business has the proper owner's investment in the current assets at all times, no trouble will arise in meeting current indebtedness. The sufficiency of the inside equity in the working asset department is a guaranty that all debts will be met at maturity, through the supplying of the owner's money at the critical time when the collections from customers and from cash sales are insufficient for meeting the debts.

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[8] For a fuller discussion of working capital requirements, see Chapters XIII and XIV.

Working Capital Requirements.—The first standard measurement of the debt-paying capacity of a business is the predetermined long-term investment in the cash, merchandise stock, raw materials, and accounts receivable. If in a given case the required long-term investment in current assets may be computed or preplanned at $75,000, and if the actual investment is only $55,000, a shortage of $20,000 will be registered, an amount that must be invested if the debt-paying capacity is to be raised to par.

Ratio of Current Assets to Current Liabilities.—The second standard measure of the debt-paying capacity is the liquidity ratio, or the ratio of current assets to current liabilities. The liquidity ratio is the relationship existing between the amount of current assets and the current liabilities. If the total current assets amount to $175,000 and the current liabilities to $50,000, the liquidity ratio is 3½ to 1, which means that there are $3.50 worth of current assets with which to meet every $1.00 of current debts. The amount of working capital, or net free current assets after paying current liabilities is here $125,000, the difference between the two amounts. This latter figure is the long-term equity in the trading and working department.[4] The balance of the current assets used in this department naturally is supplied by the short-term creditors, principally wholesalers, jobbers, and bankers.

The standard requirement of the liquidity ratio varies for each individual concern. A ratio suitable for one concern may be wholly inadequate for another. In one instance a ratio of 2 to 1 may suffice; in another a ratio of 6 to 1 may be needed to

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[4] It must be noted that the long-term investment in current assets may consist of long-term liabilities, the owner's investment or surplus profits or reserves, and not the owner's investment alone.

keep a concern solvent.[5] The higher the ratio the more liquid is its position, provided the assets are readily convertible into cash.

Current Assets			Current Liabilities		
Cash	$ 40,000		Bank Loans	$ 50,000	
Raw Materials	40,000		Accounts Payable	60,000	
Finished Goods	60,000		Acceptances	10,000	
Goods in Process	8,500		Total Current Liabilities		$120,000
Accounts Receivable	90,000				
Total Current Assets		$238,500			
Fixed Assets			Fixed Liabilities and Capital		
Plant	$100,000		Bonds	$ 75,000	
Equipment	40,000		Common Stock	100,000	
Furniture, etc.	20,000		Preferred Stock	50,000	
Total Fixed Assets		160,000	Surplus	53,500	
			Total Fixed Liabilities		278,500
		$398,500			$398,500

Working Capital, $118,500. Liquidity Ratio, 1.98 to 1.

Figure 2. Account Form Balance Sheet Featuring Ratio of Current Assets to Current Liabilities

Ratio of Quick Assets to Quick Liabilities.—A third standard measure of debt-paying capacity is the ratio of "quick assets to quick liabilities" and is more searching in its analysis. Quick assets are those current assets that are more readily convertible into cash, and may be measured from, (1) a going concern viewpoint, or (2) a liquidation viewpoint. In the former case the quick assets consist of the cash and the current live accounts receivable that will be collected in the normal customer credit term. From a liquidation standpoint the quick assets consist of the readily convertible assets at a forced sale.

The latter method of rating debt-paying capacity is the practice followed by many bankers and credit men as the "acid" test of solvency, and leads to a standard measurement that is more conservative than the use of the current or

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[5] For a fuller discussion of a safe liquidity ratio see Chapter XIII.

FEDERAL RESERVE BOARD FORM OF BALANCE-SHEET

ASSETS

Cash:
- 1a. Cash on hand—currency and coin
- 1b. Cash in bank

Notes and accounts receivable:
- 3. Notes receivable of customers on hand (not past due)
- 5. Notes receivable discounted or sold with indorsement or guaranty
- 7. Accounts receivable, customers (not past due)
- 9. Notes receivable, customers, past due (cash value, $.......)
- 11. Accounts receivable, customers, past due (cash value, $....)

Less:
- 13. Provisions for bad debts
- 15. Provisions for discounts, freights, allowances, etc.

Inventories:
- 17. Raw material on hand
- 19. Goods in process
- 21. Uncompleted contracts
  - *Less* payments on account thereof
- 23. Finished goods on hand

Other quick assets (describe fully):

....

....

Total quick assets (excluding all investments)

Securities:
- 25. Securities readily marketable and salable without impairing the business
- 27. Notes given by officers, stockholders, or employees
- 29. Accounts due from officers, stockholders, or employees

Total current assets

Fixed assets:
- 31. Land used for plant
- 33. Buildings used for plant
- 35. Machinery
- 37. Tools and plant equipment
- 39. Patterns and drawings
- 41. Office furniture and fixtures
- 43. Other fixed assets, if any (describe fully)

....

Less:
- 45. Reserves for depreciation

Total fixed assets

Deferred charges:
- 47. Prepaid expenses, interest, insurance, taxes, etc.

Other assets (49)

Total assets

LIABILITIES

Bills, notes, and accounts payable:

Unsecured bills and notes—
- 2. Acceptances made for merchandise or raw material purchased
- 4. Notes given for merchandise or raw material purchased
- 6. Notes given to banks for money borrowed
- 8. Notes sold through brokers
- 10. Notes given for machinery, additions to plant, etc.
- 12. Notes due to stockholders, officers, or employees

Unsecured accounts—
- 14. Accounts payable for purchases (not yet due)
- 16. Accounts payable for purchases (past due)
- 18. Accounts payable to stockholders, officers, or employees.

Secured liabilities—
- 20a. Notes receivable discounted or sold with indorsement or guaranty (contra)
- 20b. Customers' accounts discounted or assigned (contra)
- 20c. Obligations secured by liens on inventories
- 20d. Obligations secured by securities deposited as collateral
- 22. Accrued liabilities (interest, taxes, wages, etc.)

Other current liabilities (describe fully):

....

....

Total current liabilities

Fixed liabilities:
- 24. Mortgage on plant (due date........)
- 26. Mortgage on other real estate (due date........)
- 28. Chattel mortgage on machinery or equipment (due date........)
- 30. Bonded debt (due date........)
- 32. Other fixed liabilities (described fully):

....

....

Total liabilities

Net worth:
- 34. If a corporation—
  - (*a*) Preferred stock (less stock in treasury)
  - (*b*) Common stock (less stock in treasury)
  - (*c*) Surplus and undivided profits

Less:
  - (*d*) Book value of goodwill
  - (*e*) Deficit
- 36. If an individual or partnership—
  - (*a*) Capital
  - (*b*) Undistributed profits or deficit

Total

Figure 3. Account Form of Balance Sheet Adopted by the Federal Reserve Board, Showing Detailed Classification of Items

liquidity ratio. In fact, the practice of using the liquidation values of assets in computing immediate solvency has lead indirectly to the customary 2 to 1 ratio, which is a liquidation ratio based on the possible shrinkage of current assets. The 2 to 1 ratio indicates a possible outside loss of 50% for all assets to be sold under the hammer before creditors will lose. If the ratio be less than this figure, it indicates possible loss to creditors.

Account Form Balance Sheet.—The ratio of liquidity is readily featured in an account form balance sheet, because of the ease with which the current assets and liabilities are compared.

For example, in the balance sheet form in Figure 2, the current assets total can be readily checked against the current liabilities, and the liquidity ratio readily determined at a glance.

A detailed balance sheet in account form, adopted by the Federal Reserve Board for credit purposes is shown in Figure 3.

"Window Dressing" and the Liquidity Ratio.—The current liquidity ratio may be falsely stated and given a "paper" status that is not justified by the actual financial facts, through the process of manipulation that in some cases amounts to sharp practice. The most reprehensible of these practices is the making of a normal sale to an outside party at a substantial profit without the actual transfer of the title to the goods. The making of the "sale" causes an increase in accounts receivable by the amount equal to the cost of goods plus the gross trading profit. If the inventory is not reduced by the cost of such a sale, an absolute duplication of assets results.

"Window Dressing" Illustrated.— The liquidity ratio and the working capital are given a fictitious status, as witnessed by the following two statements:

BALANCE SHEET BEFORE "WINDOW DRESSING"

Current Assets:	
Cash	$ 20,000
Merchandise	50,000
Receivables	75,000
Total	$145,000
Current Liabilities	60,000
Working Capital	$ 85,000

Liquidity Ratio, 2.41 to 1.

BALANCE SHEET AFTER "WINDOW DRESSING"

Current Assets:	
Cash	$ 20,000
Merchandise	50,000
Receivables	125,000
Total	$195,000
Current Liabilities	60,000
Working Capital	$135,000

Liquidity Ratio, 3.25 to 1.

The practice obviously has no ethical sanction.[6] The illustration is given here to show the possibilities in the case, and to give emphasis to the need for securing professional service in the auditing of accounts and financial statements.

"Window dressing" may be done in a more subtle way with the knowledge and consent of the manager; or it may result as a natural consequence of seasonal operations and be unknown to the management.

Where there is some working capital shown in the statement, the ratio of current assets to current liabilities may be improved, i.e., made larger,[7] through the process of paying down the current liabilities through a rigorous collection policy that results in the reduction of current accounts receivable. The same effect can be secured by the selling of goods for cash, the paying off of current debts, and the non-purchase of new goods to replace the old goods sold. The non-purchase of new goods in itself keeps down the amount of current liabilities.

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[6] Such flagrant cases of abuse have been reported by practicing accountants.

[7] In this case there is no increase in the absolute amount of working capital as in the case of the fictitious sale of merchandise to accounts receivable.

A balance sheet, for example, may show the following facts:

Current Assets:	
Cash	$ 40,000
Raw Materials	40,000
Finished Goods	60,000
Goods in Process	8,500
Accounts Receivable	90,000
Total Assets	$238,500
Current Liabilities	120,000
Working Capital	$118,500

Liquidity Ratio, 1.98 to 1.

By collecting the receivables down to, say, $40,000 and reducing the finished goods by cash sales to $30,000, and applying the $80,000 cash collected to reducing the current liabilities, the balance sheet will show the following condition which reflects an improved liquidity position:

Current Assets:	
Cash	$ 40,000
Raw Materials	40,000
Finished Goods	30,000
Goods in Process	8,500
Accounts Receivable	40,000
Total Assets	$158,500
Current Liabilities	40,000
Working Capital	$118,500

Liquidity Ratio, 3.96 to 1.

If preplanned as a temporary expedient for securing a loan, the effect of this display of improved liquidity ratio, in

some cases, results in the extension of an enlarged credit from the bank that might otherwise be refused.

If after securing a loan from the bank of, let us say, $75,000, on the strength of the ratio, the total volume of wholesale credit is raised to its former amount of $120,000, the balance sheet will show the following condition:

Current Assets	$313,500
Current Liabilities	195,000
Working Capital	$118,500

Liquidity Ratio, 1.6 to 1.

This balance sheet position was not presented to the banker for original loan purposes, where the ratio was 3.96 to 1 and not the reduced ratio of 1.6 to 1.

In all cases illustrated above where "window dressing" resulted from the payment of liabilities through the reduction of current assets, the working capital remained unchanged at $118,500. Even after the bank loan of $75,000 was made, the figure was unaltered.

Trading on the Working Capital Equity and the Liquidity Ratio.—The current ratio is lowered by the increased expansion of current assets on short-term credit. As more trading is done on a given investment of net working capital, an increase is made in both the current assets and the current liabilities; but as the net working capital is not increased, the liquidity ratio declines. A balance sheet, for example, may show:

Current Assets	$175,000
Current Liabilities	50,000
Working Capital	$125,000

Ratio, 3.50 to 1.

Later, $100,000 in current assets are secured on short-term credit. The balance sheet will then show:

Current Assets	$275,000
Current Liabilities	150,000
Working Capital	$125,000

Ratio, 1.83 to 1.

If an additional $100,000 of current assets are secured, the balance sheet will show:

Current Assets	$375,000
Current Liabilities	250,000
Working Capital	$125,000

Ratio, 1.50 to 1.

While the absolute inside investment in the current assets has remained the same, the ratio of liquidity has fallen from 3.50 to 1, to 1.50 to 1, with a corresponding weakening of the credit position and the debt-paying ability. The capacity for paying debts at maturity becomes progressively more difficult, (1) as the pyramid is extended, or (2) if the turnover of the assets is not increased sufficiently to meet the payment of the payables at maturity, or (3) if the assets become unliquid.

Two factors, then, determine the ratio of current assets to current liabilities. They are, first, the absolute amount of the investment in current assets made by the owner,[8] and second, the extent to which trading is done on this inside equity. Stated otherwise, the liquidity ratio is a function of two variables, of (1) the amount of working capital, and (2) the extent of current credit operations.

The greater the credit trading on the owner's equity in current assets, the lower the ratio; the less the credit trading, the higher the ratio. But the foundation of the trading lies in the size of the long-time investment in this department. The larger the long-term investment in current assets, the higher the ratio; the smaller the investment, the lower the ratio.

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[8] Or by the investment of money raised through the flotation of long-term securities, or through the directing of the investment of profits and reserves into these assets.

Hazard of Incorrect Financing of Fixed Assets.—A study of balance sheets would be incomplete without the erection of a standard for measuring the efficacy of the plan for correctly financing and carrying fixed assets. The incorrect financing of fixed assets, according to eminent authorities, in the last analysis is the cause of most failures of large industrials. The incorrect handling of fixed assets by commercial bankers has caused scores of failures in the banking field as well. The error usually consists of tying short-term obligations to "brick and mortar" assets. Land, buildings, and equipment naturally do not "turn" into cash as a means of paying short-term obligations. Their function is that of processing, transporting, storing, etc., and last but not least, that of credit utilization in raising finances for extensions, betterments, and for working capital purposes.

In the early stages of promotion, when the plant is initially financed, the source of funds for financing fixed assets comes from stocks, bonds, mortgages, or a combination of these long-term securities. When properly engineered, no current debts, such as bankers' loans or contractors' obligations, should be used to purchase the real estate and plant, which is the most unliquid of all the property owned except the intangibles. Current debts are met out of the proceeds secured from the turnover of current assets, not out of the proceeds of the turnover of the "brick and mortar" department.

The violation of the principle of creating fixed assets on short-term credit is too far-reaching in its effects to be committed by anyone except the financial novice or the person who has been unable to complete his financial program through the funding of the current construction costs. The situation exists in some new firms and can be detected by the prospective investor or creditor through an analysis of the balance sheet.

The Ratio of Capital Assets to Capital Liabilities.—The three balance sheets in Figure 4 show at a glance, by featuring the ratio of capital or fixed assets to "capital" liabilities (stocks and funded debts), the important fact as to how the fixed assets have been financed and whether insolvency is imminent through the violation of this financial law.

Balance Sheet—A. B. C. Co.

Department A, Capital Section

Real Estate	$100,000	Common Stock	$125,000
Buildings	150,000	Preferred Stock	100,000
Equipment	75,000	Bonds	75,000
Intangibles	50,000		
Total	$375,000	Total	$300,000

Ratio of Capital Assets to Capital Liabilities, 1¼ to 1

Balance Sheet—X. Y. Z. Co.

Department A, Capital Section

Real Estate	$100,000	Common Stock	$125,000
Buildings	150,000	Preferred Stock	100,000
Equipment	75,000	Bonds	150,000
Intangibles	50,000		
Total	$375,000	Total	$375,000

Ratio of Capital Assets to Capital Liabilities, 1 to 1

Balance Sheet—W. & Co.

Department A, Capital Section

Real Estate	$100,000	Common Stock	$125,000
Buildings	150,000	Preferred Stock	100,000
Equipment	75,000	Bonds	200,000
Intangibles	50,000		
Total	$375,000	Total	$425,000

Ratio of Capital Assets to Capital Liabilities, .88 to 1

Figure 4. Showing Balance Sheet Indices that Feature Correct and Incorrect Financing of Fixed Assets

The balance sheet of the A. B. C. Co. shows this concern's financial condition to be structurally defective. The fixed assets are greater than the capital liabilities, as indicated by the ratio 1¼ to 1 of total fixed assets to stocks and bonds.

By dividing the balance sheet into Department A, the "capital section," and Department B, the "working capital section," it will be noted that the fixed assets have not been financed entirely by long-term securities, but have $75,000 of short-term credits "tied" to them. The completed balance sheet shows the following condition:

Balance Sheet—A. B. C. Co.

Department A, Capital Section			
Plant and Intangibles	$375,000	Capital Liabilities	$300,000
Department B, Working Capital Section			
Current Assets	0	Current Liabilities	75,000
Total Assets	$375,000	Total Liabilities	$375,000

It has required $75,000 of current liabilities to complete the financing of the plant and intangibles. In this case, two serious financial problems confront management, the first one being the payment at maturity of the short-term loans used to complete the plant. There are no current liquid assets with which to meet them; and there will be no excess of current assets over current liabilities until profits are made. The fixed assets cannot be used as means of payment. The immediate flotation of securities is practically the only answer to the problem, if insolvency is to be escaped in the near future. The second problem is the securing of net free working capital, without which successful operations are impossible. The current borrowing limit, and incidentally the debt-paying capacity in the above illustration is zero.

The structure of the X. Y. Z. Co., while showing an improvement over that of the A. B. C. Co., is not without its defects. Its balance sheet shows a condition of equality in the ratio between capital assets and capital liabilities. The X. Y. Z. Co. has completed its financing to the extent of relieving the plant of any current debts. However, no free working capital has been provided for merchandising purposes. Any additional funds for carrying materials, payrolls, etc., must be supplied by the general creditors of the firm. The completed balance sheet of the X. Y. Z. Co. below, shows the following condition:

	Department A		
Capital Assets	$375,000	Capital Liabilities	$375,000
	Department B		
Current Assets	150,000	Current Liabilities	150,000
	$525,000		$525,000

All of the current assets have been financed by current liabilities. The excess of the former over the latter is zero, a condition that indicates an absence of working capital.

The W. & Co. is a more nearly structurally perfect concern than the two preceding cases. No short-term obligations are tied to the fixed assets; net free working capital has been supplied through the instrumentality of long-term or funded liabilities that have a remote maturity. The ratio of fixed assets to capital liabilities, .88 to 1, indicates soundness of the financial structure. The ratio indicates the required excess of capital liabilities over capital assets. The completed balance sheet of W. & Co. shows the following condition:

Completed Balance Sheet—W. & Co.

	Department A		
Capital Assets	$375,000	Capital Liabilities	$425,000
	Department B		
Current Assets	200,000	Current Liabilities	150,000
	$575,000		$575,000

Working Capital $50,000

The $425,000 secured from common stock, preferred stock, and bonds furnished the $375,000 fixed assets, and supplied the $50,000 working capital.

The perfect score in this important ratio of capital liabilities to capital assets can be ascertained only when the absolute amount of working capital requirements of the new concern is ascertained.

If the net working capital is known in advance with any degree of accuracy, the excess of the capital credits over capital debits gives the measure of the needed working capital. In a newly financed concern, then, the working capital can be measured by (1) an excess of current assets over current liabilities, and (2) an excess of capital liabilities over capital assets. The capital ratio shows the absolute size of the working capital fund.

The account form of balance sheet is the selected instrument for featuring this ratio.

Rule for Financing Fixed Assets.—In the initial stages of financing a new enterprise, all fixed and intangible assets should be carried by securities having a remote maturity. Therefore, in all newly formed concerns the capital liabilities should be greater than, and not equal to capital assets, in order to provide (1) sufficient funds for financing the "brick and mortar" department, and (2) to provide "funded" working capital.

An equal ratio, one showing the same amount of capital assets and long-term liabilities, indicates the absence of working capital. The excess of long-term securities over fixed and intangible assets measures the completeness of the financial structure and establishes the fact of the source and the amount of the working capital.

The technique for detecting correct and incorrect financing of additional fixed assets in going concerns, subsequent to the initial financing, will be discussed in Chapters IV and V.

CHAPTER IV

CONTROL OVER SOLVENCY—COMPARATIVE BALANCE SHEETS

Insufficiency of Financial and Operating Statements.—"Annual" statements that show the operating and financial condition of a business at the close of a single period, very often are insufficient alone for purposes of judging the merits of an investment. True, a balance sheet, if properly drawn and the items contained therein properly valuated, will give a picture of the financial standing of a firm at a given moment of time. But a more important fact to know is, how did the company arrive at its present position, and what is the financial tendency with regard to the future? Did the company earn the profits represented in its statements from operations, or have they arisen from fortuitous circumstances that are not likely to recur, or have profits resulted from the inflation of assets and a general manipulation of the accounts?

Furthermore, the manager should know how the varying conditions of seasonal changes affect the fortunes of the business, as well as those changes that inevitably accompany the various phases of the business cycle. How the business was affected by the last depression; how near its surplus was depleted; to what extent were maintenance and depreciation charges suspended, and kindred problems, are as important as a knowledge of the present financial condition. With a better understanding of the manner in which the firm weathered the storms in the past, a clearer idea may be had of the possible chances of success in meeting future contingencies.

On the other hand, a balance sheet may apparently reflect a satisfactory present financial standing, when as a matter of

fact, it merely represents one of a series of steps in the downfall of a business, the inevitable failure of which may be practically conceded. A statement, for example, may show the existence of a considerable surplus, running into millions today, but upon a more careful analysis of past statements, it might be revealed that millions had already been lost, with every possibility that more would follow in the future. Or the report may reflect that while the ratio of current assets to current liabilities appears satisfactory today, yet it is fast approaching the danger line, due to an unfavorable trend.

Contents of Comparative Financial Statements.—The salient facts which comparative financial statements portray are, first, the amount and type of new resources accumulated or lost as a result of operations or of financial policies. They show, for example, whether additional liquid assets have been added to the business, or dissipated through lack of foresight or mismanagement, or whether or not the changes in the property items have been largely in the fixed asset group. Second, they show the amount and type of liabilities created or reduced, and whether or not such changes have tended to strengthen or weaken the financial fabric. Third, they show important changes in all types of reserves and of the surplus, both of which are important factors, which must be taken into account when considering changes in the equities in the business. Lastly, they show, if properly interpreted, the important causes for all changes in property and debts, and afford a clear idea as to the rationality of the financial managers who have charge of fiscal operations. Incidentally, they afford in this respect a starting point for controlling many of the ills to which business concerns are subject.

By way of illustration, take the case of the Troy Manufacturing Company given in Figure 5. The balance sheet in 1927 showed a net worth of $70,000, as against a total debt of current and fixed liabilities of $75,000, or an amount roughly equalling 48% of the total property in the business. By many of the tokens of sound finance it might be argued that the company was in good financial condition. Yet as a matter of plain fact, it has been degressing since 1925 at a rapid rate, as illustrated by the comparative balance sheet, which shows a progressive reduction in net worth from $85,000 to $70,000.

TROY MANUFACTURING COMPANY

December 31

	1925	1926	1927	Differences 1925–1927
Current Assets	$ 20,000	$ 25,000	$ 30,000	+$10,000
Fixed Assets	40,000	50,000	75,000	+ 35,000
Permanent Investments	60,000	50,000	40,000	− 20,000
	$120,000	$125,000	$145,000	+$25,000
Current Liabilities	$ 5,000	$ 10,000	$ 25,000	+$20,000
Fixed Liabilities	30,000	40,000	50,000	+ 20,000
Net Worth	85,000	75,000	70,000	− 15,000
	$120,000	$125,000	$145,000	+$25,000

Figure 5. Comparative Balance Sheet

To assume that the stock of the firm is a good investment would be inaccurate, without a further analysis into the causes of the reduction in the surplus account as well as a more detailed study in the matter of ratios between current assets and current liabilities during these years. If the financial situations were reversed and the 1927 preceded the other two years, it would again follow that it is not only unsafe but unwise to base complete judgment on the financial condition of a business on a single year's showing. It is always more expedient to study the history of past fiscal facts. The financial trend and the causes, therefore, are more important than the status quo of today.

Source and Utilization of Funds.—The dynamic factors that cause the fundamental changes in financial structures of

WESTERN METAL PRODUCTS COMPANY

	1925	1926	1927	Differences 1925–1927
ASSETS				
1. Real Estate	$ 30,000	$ 30,000	$ 30,000	$ 0
2. Buildings	45,000	51,000	56,000	+ 11,000
3. Goodwill	25,000	25,000	25,000	0
4. Machinery	60,000	47,500	49,500	− 10,500
Total Fixed Assets	$160,000	$153,500	$160,500	+$ 500
5. Cash	$ 12,150	$ 11,150	$ 15,000	+$ 2,850
6. Accounts Receivable	19,850	15,000	18,000	− 1,850
7. Notes Receivable	15,000	18,000	17,000	+ 2,000
8. Finished Goods	49,500	65,000	63,000	+ 13,500
9. Raw Materials	10,000	8,250	9,000	− 1,000
10. Investments	10,000	25,000	10,000	0
Total Current Assets	$116,500	$142,400	$132,000	+$15,500
Total Assets	$276,500	$295,900	$292,500	+$16,000
LIABILITIES				
1. Common Stock	$100,000	$100,000	$100,000	$ 0
2. Preferred Stock	100,000	100,000	100,000	0
3. Bonds Payable	0	25,000	25,000	+ 25,000
Total Capital Liabilities	$200,000	$225,000	$225,000	+$25,000
4. Notes Payable	$ 26,000	$ 2,000	$ 4,000	−$22,000
5. Accounts Payable	14,000	15,000	8,500	− 5,500
Total Current Liabilities	$ 40,000	$ 17,000	$ 12,500	−$27,500
6. Reserves for Depreciation	$ 21,300	$ 29,200	$ 30,400	+$ 9,100
7. Surplus Profits	15,200	24,700	24,600	+ 9,400
Total Reserves and Profits	$ 36,500	$ 53,900	$ 55,000	+$18,500
Total Liabilities	$276,500	$295,900	$292,500	+$16,000

Figure 6. Comparative Balance Sheet Showing Differences by Items and Significant Groups

business concerns can be arranged into two groups: first, those items that represent the source of new funds coming into the business, and second, the utilization of those funds in the upbuilding of the financial structure. As a starting point, all new funds come into a business through one or more of the following five sources. They are:

1. Investments on the part of owners
2. Increase of all types of liabilities
3. Reinvestment of surplus profits
4. Reinvestment of all types of reserves
5. Conversion or sale of assets

The five uses to which funds may be put in a business are:

1. Withdrawal of funds by the owners or the purchase of capital stock
2. Reduction of all types of liabilities
3. Payment of profits as dividends
4. Operating losses (or deficits)
5. Increase in assets

The source and utilization of funds can best be illustrated with the aid of the specific example in Figure 6 which gives a comparative balance sheet report for the years 1925, 1926, and 1927 inclusive.

By checking the comparative balance sheet of the Western Metal Products Company for the years 1925-1927, it will be noted that the sources of new funds were as follows:

1. Machinery sold	$10,500
2. Accounts receivable collected	1,850
3. Raw materials reduced	1,000
4. Bonds payable increased	25,000
5. Reserve for depreciation increased	9,100
6. Surplus profits increased	9,400
Total sources of funds	$56,850

The total new funds amounting to $56,850 were utilized for the following purposes:

1. Buildings additions	$11,000
2. Cash increased	2,850
3. Notes receivable increased	2,000
4. Finished goods increased	13,500
5. Reduction notes payable	22,000
6. Reduction of accounts payable	5,500
Total utilization of funds	$56,850

Mathematically these two funds will always balance, as they represent the difference in items that are in equilibrium.

Analysis of Sources.—Let us now take up each of the sources of funds and analyze them.

1. The reduction in the machinery of $10,500 represents the sale[1] of a fixed asset, and the surrendering of the value for use by other departments in the business.

2. The reduction in accounts receivable of $1,850 indicates a lessening of credit extension and a shorter "investment" in customer accounts. More customers paid their accounts in the last year than first year; or this year's sales may have been smaller, resulting in less outstanding credit.

3. Raw materials reduced by $1,000 show a withdrawal of values invested in this department. As the stores were drawn down for use in the factory, a lesser amount was replaced through purchases.

4. Bonds payable increased to $25,000 represent the flotation of new securities, the money being used for increasing assets or in reducing debts.

5. The increase in the reserve for depreciation of $9,100 represents the incoming of new values for the purpose of renewing the old assets when the latter are scrapped. The reserve registers the amount of the new values that came through gross revenues and are now reserved for replacement purposes.

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[1] This reduction may represent the loss of value due to destruction and the charging of the amount to surplus. This will be taken up for a later discussion.

6. The increase in the surplus of $9,400 marks the increase of new values represented by the excess of new property remaining after the "marking" of that portion covered by the reserve. It is the amount of net profits reinvested in the business.

Analysis of Utilization.—The use of the new funds may be explained as follows:

1. Increase in buildings of $11,000 shows the placement of a portion of the new funds obtained from all sources in the plant during the year.

2. Cash increased by $2,850 indicates the use of funds for increasing the cash position. The bank account contains more cash supplied by other departments.

3. Increase in notes receivable represents the probable conversion of open accounts into notes, the source being the accounts receivable.

4. Finished goods increase $13,500 shows an investment in this department contributed out of raw materials and other operating sources.

5. The reduction of $22,000 in the notes payable indicates the use of other funds for the redemption of this debt. The source evidently came from the bonds which were substituted for the notes.

6. The reduction of the accounts payable shows the use of funds for current debt reduction.

Source and Utilization of Funds by Departments.—A more fundamental explanation of the source and utilization of funds may be secured by dividing the balance sheet report as shown below into three sections, representing the outstanding functions of the financial structure. The first section contains the fixed or capital assets and the capital liabilities.[2] This has been called Department A, the "brick and mortar" department, as it furnishes the framework of the structure. The long-term or capital liabilities are placed in this department because it is from this latter source that funds are normally supplied for creating the fixed assets.

Department B contains the current liquid property, such as cash, merchandise, customer accounts, etc., and the corresponding current or short-term debts. This department represents the life blood of the business.

DEPARTMENT A

A_1 Fixed Assets A_2 Capital Liabilities

DEPARTMENT B

B_1 Current Assets B_2 Current Liabilities

DEPARTMENT C

C_1 Deficit C_2 Surplus and All Reserves

Department C, containing the surplus and all reserves, forms the dynamic section of the balance sheet; it represents, (1) the permanent changes in the owner's equity by registering the new values placed in the business in the form of reinvested profits, and (2) the changes in the valuation accounts, that is, reserves that register the new values placed in the business in the form of reinvested funds normally used for replacements. The surplus and reserve items represent the new values that normally increase the working capital, additions and betterments in the plant, and cause the permanent reduction in the debts. This department registers the improvement in the foundation of the structure, namely, the inside or owner's equity, and the depreciation reserves pledged to renew the worn-out assets.

Reserves Shown as Credit Items.—In many comparative balance sheet studies, the valuation reserves are deducted from their related assets and the net change in the value of the property items only is shown in the source and utilization of funds.

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[2] Capital liabilities consist of capital stock, bonds, mortgages, etc., that is, securities having a remote maturity.

This method is satisfactory for those years where there are no additions to the assets. The ordinary depreciation reserves as recorded register a decline of asset values. However, where there are additions to assets together with increases in the valuation reserves, the one will offset the other, and no net change either in the source or in the utilization of funds will be noted.

Where the asset is written down without the use of a reserve, the source of funds ostensibly is the reduction of the asset values. This is not a true fact, as reducing values do not contribute new funds. Neither do losses from other physical causes contribute new funds. The real source lies in the gross revenues set aside in the depreciation reserve. The utilization will be represented in the investment in new property or the reduction of liabilities.

The point to note here is that an increasing reserve which reduces one property item may be offset by an increase of a like amount in another property item. For example, by this plan the following ledger entries would result in no net change in either sources or utilization of funds.

PLANT ACCOUNT

Original Cost	$500,000		
Additions and Betterments 1928	25,000		

RESERVE FOR DEPRECIATION PLANT

		Previous Balance	$120,000
		Current Depreciation 1928	25,000

But the real facts are that there was a source of $25,000 represented by the reserve for depreciation, and also a utilization of $25,000, which resulted in an addition to plant, facts which are entirely obscured where the reserve is not shown separately.

In the case, let us say, where the new reserve money has been reinvested in current assets or in the reduction of current liabilities, a false source of funds is given under the older plan of not showing reserves separately, because under this system of reports the source is indicated as a reduction of plant values, and the utilization in the upbuilding of working capital. In reality the source of new values came from revenue, now pledged in the reserve for renewal purposes.[3]

The Trend of Funds.—By grouping the balance sheet charges (sources and utilization of funds) in their proper departments, a significant "trend of funds" may be detected that will indicate whether or not the financial structure is being weakened through wrong financial engineering practices, or if the structure is being strengthened by proper policies. There are certain distinct trends of funds, for example, that show a persistent drift of resources into the brick and mortar department, from the other departments of the business. Again, there may be a decided drift away from the fixed assets to the current assets, or a net trend of funds from capital liabilities to current liabilities, or from current liabilities to capital assets or capital liabilities. Again, there may be a drifting of funds from surplus and reserves to various assets or liabilities, or a trend into the surplus and reserve from other departments. Some of these trends are desirable, while others are wholly undesirable and are to be avoided.

Departmental Trend of Funds.—For the sake of clearness, the various trends of funds may be listed according to the major departments of the balance sheet involved. They are: (1) the financing of fixed assets and the handling of capital liabilities, or the significant changes in Department A; (2) the financing and the dissipation of working capital, or the significant changes in Department B; (3) the use of surplus and reserve funds, or the significant trends into or out of Department C. These changes may be the result of formal financial policies on the part of management, or they may result from general business conditions beyond its control.

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[3] The plan of showing all types of reserves separately obviates the necessity of making special adjustments in the working papers for reserves, and gives a ready means of analyzing the trend of funds.

The essential facts to be observed in the analysis of the trend of funds into the capital department are these: (1) Is the department absorbing funds from other departments from year to year, or is it contributing to the other departments? (2) Are these trends desirable, i.e., do they strengthen the financial fabric? (3) What particular policy is involved in the process of change and who is directly responsible for the policy? (4) What policy must be followed to remedy the existing evil, if the trend of funds is undesirable?

The same general approach may be applied in the analysis of the significant group changes; the working capital department, the surplus and reserve department, as well as the capital department. In each case where an analysis is made it is important that the net change in the department as a whole be noted, i.e., for example, the net trend of funds into and out of the department. Next, the changes within the departments themselves should be carefully analyzed, to ascertain if the internal changes within the departments are structurally sound.

The Trend of Funds into Fixed Assets in a Going Concern.—We shall now take up some specific illustrations in the trend of funds as applied to capital assets and capital liabilities. In Chapter III an illustration was given which showed the incorrect financing of fixed assets in the initial stages of promotion, and how this condition registered itself in the first fiscal balance sheet drawn up before a firm reached a going concern status. The following illustration shows how the incorrect financing of fixed assets after a firm has become a going concern will be registered in a comparative balance sheet.

CHICAGO IMPLEMENT COMPANY

1924–1927

	1924	Per Cent	1925	Per Cent of 1924	1926	Per Cent of 1924	1927	Per Cent of 1924	Change in Per Cent
ASSETS									
Current Assets	$150,500	100	$145,300	96.5	$135,250	89.8	$135,000	89.7	−10.3
Fixed Assets	200,000	100	225,800	112.9	230.500	115.2	241,800	120.9	+20.9
Intangibles	40,875	100	40,000	97.9	50,000	122.3	52,000	127.2	+27.2
Total Assets	$391,375	100	$411,100	105.04	$415,750	106.2	$428,800	109.5	+ 9.5
LIABILITIES									
Current Liabilities	$ 75,000	100	$ 95,000	126.6	$ 94,850	126.4	$106,000	141.3	+41.3
Fixed Liabilities	100,000	100	100,000	100.0	100,000	100.0	100,000	100.0	+ 0
Stock	125,000	100	125,000	100.0	125,000	100.0	125,000	100.0	+ 0
Surplus	51,375	100	50,100	97.5	51,400	100.0	54,000	105.1	+ 5.1
Reserves	40,000	100	41,000	102.5	44,500	111.2	43,800	109.5	+ 9.5
Total Liabilities	$391,375	100	$411,100	105.04	$415,750	106.2	$428,800	109.5	+ 9.5

TREND OF FUNDS BY DEPARTMENTS, 1924–1927

CHICAGO IMPLEMENT COMPANY

DEPARTMENT A

Fixed Assets	+$41,800	Capital Liabilities Increase	0
Intangibles	+ 11,125		
Total Increase	$52,925	Net Absorption of Funds in Department A	$52,925

DEPARTMENT B

Current Assets	−$15,500	Current Liabilities	+$31,000
Net Increase in Liabilities	+ 31,000		
Net Loss in Working Capital, Department B	$46,500		

DEPARTMENT C

Surplus	+$ 2,625
Reserves	+ 3,800
Total Increase	$ 6,425

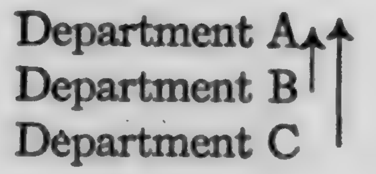
RECAPITULATION—TREND OF FUNDS

1. Net Loss, Department B Working Capital	$46,500
2. Net Investment of Profits and Reserve from Department C	6,425
3. Net Absorption of Funds in Capital Assets, Department A	$52,925

Figure 7. Structural Balance Sheet, Showing Trend of Funds by Departments

In this particular case the Chicago Implement Company (see Figure 7) expanded its fixed assets by $41,800, or 20.9%, over the 1924 figures, and its intangibles by $11,125, or 27.2%. The capital liabilities, having a remote maturity, which should have been used as a source of funds for providing these fixed assets, were not increased at all. The entire amount of $52,925 was supplied, $46,500 by Department B, and $6,425 by Department C; and since the working capital was decreased, all of the surplus profits and also the funds represented by the increase in reserves were planted together with the loss in working capital, in the fixed assets and intangibles. There were no other sources from which this $52,925 placed in the brick and mortar department could have been supplied.

Summarized in a simpler form, a diagrammatic trend of funds of the three major departments of the Chicago Implement Company, shown in Figure 7, may be illustrated as follows:



This type of financing is just as faulty as was the former case, where the plant and real estate were purchased on bank loans. If, in any balance sheet, the fixed assets or intangibles show a continuing increase greater than the increase in stocks, bonds, mortgages, profits, and reserves, the case should be investigated. The funds must have been provided from some source, and if not secured from some one of the capital liability items or from surplus and reserves, a check should be made to ascertain if the money has been supplied from working assets or by increasing current liabilities.

In case the preponderance of the increase in fixed assets over fixed or capital liabilities is relatively large, some additional financing through the sale of securities must follow within a short time, probably at the end of the usual bank credit cycle. Without the flotation of some form of securities, normally called funding of the floating debt, a serious impairment of working assets will result, unless the deficiency is covered from profits or reserves in the very near future.

No immediate harm is done to the financial structure of a concern if a limited amount of expansion in the form of additions and betterments is made through the expenditure of cash derived from the sale of goods, from the collections received from customers, or from the creation of current liabilities. The real harm comes from continuing the practice. In general, if more money is tied up in fixed assets from year to year than is added back in the form of fixed or capital liabilities, from profits or various forms of reserves, an unwarranted strain is placed on liquid resources. In the end it will cause the failure of a concern unless properly remedied.

The Trend of Funds into Working Capital.—Working or current assets represent the life-blood of a business; the fixed assets its structure. Both are necessary for the proper functioning of any business venture. However, experience has shown that it is a derangement of the orderly functioning of working assets that usually brings financial disaster. Any material change in the synchronizing of stock turnover, the receivables turnover, the current expenses fund turnover, with the immutable turnover of accounts and notes payable, usually compels the immediate attention of the finance manager.

Since insolvency, in the last analysis, is caused by (1) the shortage of liquid funds due to a slowing down of operations, coupled with the constant overhead expenses; or (2) the tying up or freezing of normal current assets caused by the buying of unsalable goods; or (3) the financing of capital expenditures with current assets or current liabilities, the reader of comparative balance sheets should be put on his guard in order to detect insolvency trends through the use of special reports that show graphically the unfavorable indices that register structural difficulties.

The study of a comparative balance sheet will reveal whether or not any working assets have been supplied by the proprietors, and whether or not this fund has been increased through flotation of capital liabilities or through profits and reserves. As shown previously, the initial balance sheet, prepared before operations are begun, will always show in what manner the "dead load" of working assets was supplied.

Working Capital Expansion.—As the business progresses and requires additional current assets with which to provide expansion of inventories, receivables, and cash, it is just as imperative that these increases be correctly financed as a going concern, as they were in the beginning when working capital was financed with long-term investments. Larger inventories that result from enlarged buying, and larger accounts receivable that result from a more liberal granting of credit or expansion of sales, must be financed from some new source. If the accounts payable created by enlarged buying, fall due before collections are made, the added credit load must be carried by someone, and unless the creditors or the bankers are willing to assume the rôle of permanent investors in the business by an extension of indeterminate credit, the funds for the expansion of working assets must be secured from investors or from the business itself. In this respect a comparative balance sheet gives an infallible index of the soundness or weakness of working capital financing from year to year.

If properly handled, all increases in working assets should come from one or more of the following sources, viz.: (1) the sale of fixed assets, (2) the increase of capital liabilities, (3) reinvested profits, or (4) reinvested reserves.

Working Capital Financed through Capital Liabilities.—Refer to the comparative balance sheets shown below. It will be noted that from 1925 to 1927, current assets increased $50,000 and fixed assets $20,000. Since common stock and likewise accounts payable remained unchanged, it is evident that the increase in plant and current assets came from an increase in preferred stock and mortgage bonds. Both methods represented sound financing. The maturity of new liabilities tied to the plant and to current assets items is remote. In the case of the current asset increase, no immediate liability was created which could later remove an equivalent quantity of cash when the debt was redeemed. The changed condition resulted in an absolute increase in working capital, an increase in the load carried by the investors. Neither the general creditors nor the banker were in any way involved.

	1925	1926	1927	Changes 1925–1927
Plant	$175,000	$195,000	$195,000	+ $20,000
Real Estate	60,000	60,000	60,000	+ 0
Patents	75,000	75,000	75,000	+ 0
Current Assets	70,000	90,000	120,000	+ 50,000
	$380,000	$420,000	$450,000	+ $70,000
Common Stock	$200,000	$200,000	$200,000	+ $ 0
Preferred Stock	100,000	140,000	140,000	+ 40,000
Mortgage Bonds	50,000	50,000	80,000	+ 30,000
Accounts Payable	30,000	30,000	30,000	+ 0
	$380,000	$420,000	$450,000	+ $70,000

Working Capital Financed by Profits and Reserves.—The financing of working capital through the reinvestment of profits and all types of reserves may be detected in the same manner. While there may be some question as to the advisability of expanding on profits, due to the fact that certain of the current assets may be liquidated for the purpose of paying dividends, nevertheless the method is used broadly wherever profits are "ploughed back" into the working capital. Surplus earnings may find their way to extensions of plants, into current assets, or both.

The proof of the location of the investment of profits is found by comparing the fixed assets and capital liabilities between periods. If an increase in plant, real estate, etc., takes place without a corresponding increase in capital liabilities, it follows that the source of the increase has been either taken from working capital, from earnings, or from reserves. If the excess of current assets over current liabilities (the measure of the amount of working capital) remains materially unchanged from year to year, the new financing has been accomplished from profits, or reserves, as shown in the comparative balance sheet below:

	1925	1926	1927	Changes 1925-1927
Plant	$175,000	$195,000	$210,000	+ $35,000
Real Estate	60,000	65,000	65,000	+ 5,000
Patents	75,000	75,000	75,000	0
Current Assets	70,000	90,000	120,000	+ 50,000
	$380,000	$425,000	$470,000	+ $90,000
Common Stock	$200,000	$200,000	$200,000	$ 0
Preferred Stock	100,000	120,000	120,000	+ 20,000
Mortgage Bonds	50,000	50,000	60,000	+ 10,000
Accounts Payable	30,000	30,000	30,000	0
Surplus and Reserves	0	25,000	60,000	+ 60,000
	$380,000	$425,000	$470,000	+ $90,000

Illustrated by Trend of Funds Report.—By grouping the various items of this balance sheet in three characteristic groups of (a) Capital Assets and Capital Liabilities, (b) Current Assets and Current Liabilities, (c) Surplus and Reserves, and by showing the net changes in these groups, this slightly involved financial situation may be readily understood.

Capital Assets:		—(a)—	Capital Liabilities:	
1. Plant	$35,000		1. Preferred Stock	$20,000
2. Real Estate	5,000		2. Mortgage Bonds	10,000
Total	$40,000		Total	$30,000
Current Miscellaneous Assets	50,000	—(b)—	Current Miscellaneous Liabilities	0
		—(c)—	Surplus and Reserves	60,000
	$90,000			$90,000

Capital assets increased by $40,000 between 1925 and 1927, while capital liabilities increased by only $30,000. The deficiency of $10,000 comes from sources other than long-term investments. Since the working capital shows an increase over the previous years, the increase in capital assets did not come from current assets or from the creation of additional current liabilities. Reinvested profits and reserves, then, must have supplied all of the additional working capital. In addition they supplied the new values invested in the plant and real estate not furnished through capital liabilities. There is no other channel through which this financing could take place.[4]

Here we have an example par excellence of sound financial engineering, represented by the increase of the most important property of a business, viz., working capital, through the successful creation of surplus and reserves which have no claims against the working fund, except those which the management may choose to create and honor.

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[4] The exact manner in which surplus becomes the so-called source of these new funds requires further explanation. As a matter of fact, all new values coming into the business take the form of tangible property items, chiefly cash. The making of profits involves the receiving of greater money values than are paid out in the handling of commodities or services. When residual values, representing this surplus of income over cash expenses, are left in the business and not paid out in the form of dividends, the result is either a positive increase in assets, or a reduction in liabilities. The increase may take the form of cash or merchandise bought with cash, or it may take the form of accounts and notes receivable which represents but one step forward in the turnover of working assets.

Part or all of the residual surplus values left in the business may also be found in the same manner in the increases in property items. The rein-

Expansion of Current Assets on Short-Time Loans.—A dangerous plan for increasing the assets of the trading department for expansion purposes is through the creation of short-term credit obligations. This tendency should be checked carefully by the owner or credit man. An example of this type of financing is shown above.

	1925	1926	1927	Changes 1925–1927
Plant	$175,000	$195,000	$210,000	+ $35,000
Real Estate	60,000	65,000	65,000	+ 5,000
Patents	75,000	75,000	75,000	0
Current Assets	70,000	90,000	120,000	+ 50,000
	$380,000	$425,000	$470,000	+ $90,000
Common Stock	$200,000	$200,000	$200,000	$ 0
Preferred Stock	100,000	110,000	110,000	+ 10,000
Mortgage Bonds	50,000	50,000	50,000	0
Accounts Payable	30,000	60,000	90,000	+ 60,000
Surplus and Reserves	0	5,000	20,000	+ 20,000
	$380,000	$425,000	$470,000	+ $90,000

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vestment of reserves may be explained in much the same manner. In the last analysis reserve for depreciation or for other losses is an earmarked portion of income, set aside for replacing worn-out property items. Generally the old asset value remains intact. While depreciation represents a loss, nothing tangible has been removed. But new tangible property in the form of miscellaneous current assets are brought into the business. If operations have been successful enough to add sufficient values to take the place of the old worn-out values, a ledger increase will be noted, as for example in the following case:

A. B. C.—BALANCE SHEET, 1926

Property Items	$100,000	Capital Stock	$125,000
Current Assets	50,000	Current Liability	25,000
	$150,000		$150,00

BALANCE SHEET, 1927

Property Items	$100,000	Capital Stock	$125,000
Current Assets	50,000	Current Liability	25,000
"New Current Assets"	10,000	Reserve for Depreciation	10,000
	$160,000		$160,000

"New Current Assets" in time will be sufficient to replace the property when the latter is scrapped.

By arranging the changes in the various items according to the characteristic groups suggested previously, it will be noted that all of the working assets were supplied from accounts payable.

Capital Assets:		—(a)—	Capital Liabilities:	
1. Plant	$35,000		1. Preferred Stock	$10,000
2. Real Estate	5,000			
Total	$40,000			$10,000
Current Assets:		—(b)—	Current Liabilities:	
1. Miscellaneous	$50,000		1. Accounts Payable	$60,000
		—(c)—	Surplus and Reserves	20,000
	$90,000			$90,000

Accounts payable together with the surplus of $20,000 supplied all of the $30,000 excess of plant and real estate over preferred stock. The danger of this tendency in fund changes is apparent. Should the creditors call for the payment of current loans when due, assuming no acceleration in the turnover of merchandise or receivables, the firm would be seriously embarrassed. A complete payment of loans might result in a reduction of the working capital, which would have an effect of curtailing operations, unless the firm immediately resorted to long-term financing which it should have done in the first instance.

Standards for Measuring Favorable Trends of Funds.—The three favorable trends of funds that show an improved working capital position may be shown diagrammatically. The illustration below indicates the flotation of capital liabilities (Department A), and the investment of the money in current assets (Department B), or in the reduction of current liabilities. A part of these funds may be invested in the plant (Department A), in which case the balance may be invested in working capital.

(I)

$$\begin{tikzcd}
A_1 & A_2 \arrow[dl] \arrow[d] \\
B_1 & B_2 \\
C_1 & C_2
\end{tikzcd}$$

The second illustration shows the trend of funds from Department A fixed assets to Department B current assets, or to current liabilities, in effect resulting in a reduction in the plant investment and the placing of the proceeds in working capital.

(II)

$$\begin{tikzcd}
A_1 \arrow[d] \arrow[dr] & A_2 \\
B_1 & B_2 \\
C_1 & C_2
\end{tikzcd}$$

It is assumed here that the reduction of plant values is the result of the sale of property, and not the destruction or scrapping of the plant. These latter factors can be detected only by ledger inspection, and should be treated separately in comparative balance sheet interpretation.

The third illustration shows the trend of funds from Department C surplus and reserves, to Department B current assets, and to reducing current liabilities, which shows the investment of surplus profits and reserve money in this department, as shown below:

(III)

$$\begin{tikzcd}
A_1 & A_2 \\
B_1 & B_2 \\
C_1 & C_2 \arrow[ul] \arrow[u]
\end{tikzcd}$$

The trend of funds into Department B shows the marshalling of the funds of the business into the central working capital department where they will be available for enlarging operations and improving the debt-paying position of the firm through an increase in the liquid assets or the reduction of current liabilities. All three tendencies improve the liquidity ratio position, and add to the net working capital owned by the firm. They represent the only methods by which the working capital of any firm may be increased.

CHAPTER V

CONTROL OVER SOLVENCY—COMPARATIVE BALANCE SHEETS (CONTINUED)

The Conservation of Working Capital.—The amount of working capital required by a business cannot be predetermined with a great degree of accuracy, especially if the trade is seasonal or is very sensitive to changes in general business conditions. In most going concerns the determination of the correct amount of permanent investment in working capital is a matter of trial and error. If accounts and notes payable are promptly paid, it is safe to assume that, unless conditions of slow collections and money stringency arise, a sufficient amount has been invested.

The investor is naturally limited in making investigations along these lines, unless he has access to the bookkeeping records. Increasing notes payables, with perennial requests for their renewal, usually is an indication of the need of funding this department. Other checks are often found in the loss of purchase discounts, the granting of unusual sales discounts, high interest costs, the giving of notes to creditors, an overzealous collection policy, slowing of stock turnover, and restricted merchandise stocks.

The balance sheet index of working capital is the difference between current assets and current liabilities. As an increasing shortage of working capital is fatal in the long run, it is highly important to know the causes for its diminution. Checks should be made from time to time to ascertain if this trend is in progress, and to see into what department the funds are going and for what purpose.

How Working Capital Is Reduced.—In general, working capital may be diminished in five ways:[1] (1) Through the building of permanent assets from working assets, or current debts; (2) through the reduction of fixed liabilities from the working assets or current debts; (3) through the payment of dividends; (4) through the replacement of property, the depreciation for which has been accumulated through reserves which have been "invested" in the working capital; and (5) the withdrawal of cash or property by proprietors through the redemption of capital stock, or the reduction of the owners' capital investment.

Financing Fixed Assets.—The manner in which fixed property items may be financed, in whole or in part, directly from working capital without the flotation of securities, has been described. (See Figure 7, *et seq.*)

Amortizing Capital Liabilities.—The utilization of cash, inventories, or open accounts for the purpose of amortizing bonds or mortgages has the same effect as the creation of additional fixed assets. The reduction of debts of this type is tantamount to an investment in capital assets. In both cases a diminution of liquid assets occurs, and unless an equivalent amount is added from profits or reserves, it follows that the contribution was made from working capital. This tendency tends to impair credit, and often calls for the issuance of more stock, bonds, or long-term notes in the near future. If these long-time securities are not issued, a hand-to-mouth financial policy is revealed.

Payment of Dividends.—The payment of dividends is dangerous if it depletes cash necessary for the conduct of the business. This is especially true if the trading department has embarked on a policy of expansion, and has necessary funds tied up in a greater extension of credit to customers or in enlarged inventories. Invariably, policies of expansion carry with them an added line of credit extended by jobbers and wholesalers, and unless an oversupply of cash and securities exists, the payment of dividends removes funds that normally should be used to cover invoices from general creditors.

The payment of dividends which have been declared is merely a reduction of current liabilities. The reduction of the surplus together with a falling off in working capital is an index of the payment of accumulated earnings.

The comparative balance sheet below illustrates a tendency in respect to the reduction of working capital for dividend payments. Working capital (current assets minus current liabilities) was reduced from $55,000 in 1925, to $30,000 in 1926, and to $25,000 in 1927, or a total loss of $30,000.

	1925	1926	1927	Changes 1925–1927
Plant	$ 80,000	$ 80,000	$ 80,000	$ 0
Real Estate	40,000	40,000	40,000	0
Current Assets	75,000	80,000	80,000	+ 5,000
	$195,000	$200,000	$200,000	+$ 5,000
Stock	$100,000	$100,000	$100,000	$ 0
Mortgages	30,000	20,000	20,000	− 10,000
Accounts Payable	20,000	50,000	55,000	+ 35,000
Surplus	45,000	30,000	25,000	− 20,000
	$195,000	$200,000	$200,000	+$ 5,000

The changes may be listed according to sources and utilization of funds.

(a) The sources were as follows:

1. Working capital reduced	$30,000

(b) The utilization was as follows:

1. Reduction of surplus	$20,000
2. Reduction of mortgage	10,000
Total	$30,000

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[1] The same point may be used to explain the loss in value of fixed property, excepting (1).

or the same thing may be stated thus:

(A) Sources:		
1. Increase in Current Liabilities		$35,000
(B) Utilization:		
1. Reduction of Surplus	$20,000	
2. Reduction of Mortgage	10,000	
3. Increase Current Assets	5,000	
	$35,000	

The increase in current liabilities without a corresponding increase in current assets indicates a temporary net loss in working capital, and a permanent loss if the newly created accounts payable are paid from current assets, which is nearly always the case.

Replacement of Property.—In order to illustrate the manner in which a comparative balance sheet reflects the use of working capital for replacing fixed assets, it is necessary to understand the manner in which depreciation reserves indicate the accumulation of property to be later used for replacement. (See footnote, page 69.) Reserves for losses in property values function in a broad way to check the payment of dividends. They represent a portion of the excess values brought into the business through gross income, and set aside specifically for renewal purposes. Particular assets rarely are "earmarked" or set aside for this end; the reserve indicates the amount of property merged with all other assets, that may be liquidated and used for replacing worn-out parts. If it is assumed that the creation of the reserve parallels in amount the shrinkage in value of the property, the net value of the asset at any time will equal its ledger value minus the reserve. At the end of the service life of the asset, the reserve should equal the total net loss due to depreciation, obsolescence, etc.

If the balance sheet shows that no new investments have been made in fixed property, the entire amount of the reserve has been reinvested in working capital, as previously explained.

When the time comes for renewals, the value of the replaced part must be taken from current assets and used to purchase the new fixed asset. If this is not done new financing must be undertaken. If accomplished by current loans, working capital will be reduced when the loan is paid.

The net effect on the balance sheet will be the disappearance of the reserve for depreciation and an equivalent loss in working capital, as shown in the following case:

Debits	1923	1924
Property Items	$100,000	$100,000
Current Assets	60,000	50,000
	$160,000	$150,000
Credits		
Capital Stock	$125,000	$125,000
Reserve Depreciation	10,000	
Current Liabilities	25,000	25,000
	$160,000	$150,000

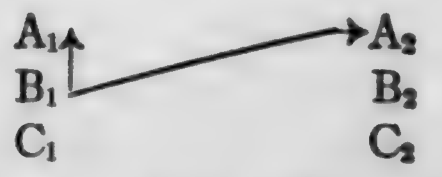
The usual accounting procedure is either to close the reserve into the property item, thereby eliminating the former and reducing the latter to $90,000, and then raise the property item to its old figure of $100,000, or to close the reserve account by a direct charge from cash.

Withdrawal of Property by Owners.—The withdrawal of working capital by the proprietor of a business is accomplished with the same results as the reduction of capital liabilities, or the payment of dividends.

Standards for Measuring Unfavorable Trends of Funds.—In diagrammatic form there are four unfavorable trends of funds that show the diminution of working capital. They are:

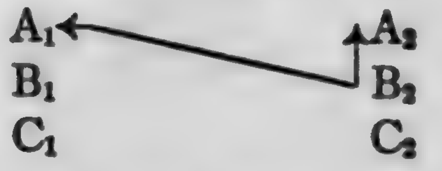
First, funds from Department B to Department A, which show the use of current liquid assets for (a) the building of plant, or (b) the reduction of capital liabilities, representing an absolute loss in the working capital fund. The trend is shown as follows:

(I)



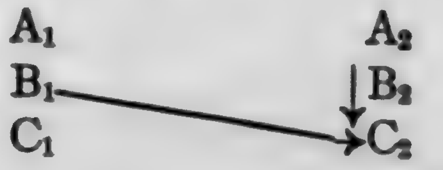
Second, funds moving from Department B to Department A which show the short-time borrowing and the use of the money for (a) building the plant, or (b) reducing funded debt or the repurchase of stock from owners. This trend is shown as follows:

(II)



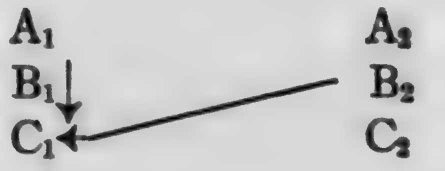
Third, funds moving from Department B to Department C show the payment of dividends or the replacement of property and the loss of the net working capital. It is *per se* dangerous if followed to extremes. This trend is shown as follows:

(III)



Fourth, the moving of funds from Department B to Department C shows operating losses and the reduction of working capital through the unsuccessful conduct of the business. This change is the most dangerous of all trends and should be watched carefully. It is shown as follows:

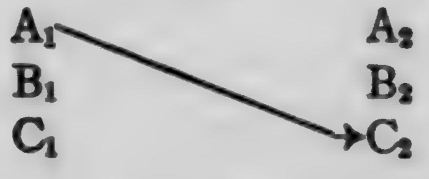
(IV)



The fact that funds are daily changing from one department to another should not obscure the ultimate destination of money investments, and still more important, the more or less permanent trend of funds. The fact that dollars go from one department one day and back the next, is not important. A longer period should be used for measurement. It is the month by month, year by year trend causing fundamental changes that should be noted. This chart device is introduced here simply to give a technique, for diagnosing "structural" changes as shown by a study of the trend of funds. It gives in graphic form the good and bad tendencies in fundamental financial conditions.

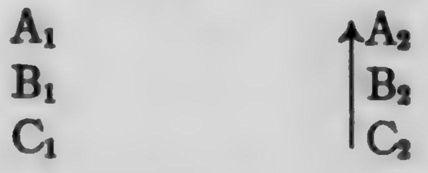
Miscellaneous Trends of Funds.—Another trend of funds that may be graphically shown is the loss of plant values and the charging of the same to surplus. Funds from Department A to Department C would be an indication of such a loss as shown in the following diagram:

(V)



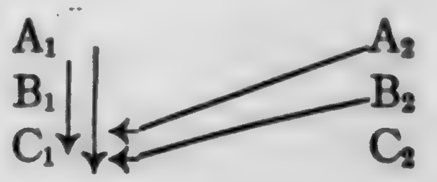
Stock dividends show a trend of funds from Department C to Department A. While this does not represent a change in actual funds, nevertheless the bookkeeping facts are registered in the balance sheet as shown in the following diagram:

(VI)



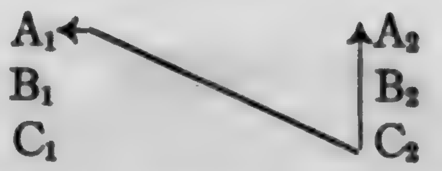
Deficits may be registered in a score of manners. The trend may be from Department A or Department B. In all cases the change virtually represents the "sinking" of values into a negative surplus. Diagrammatically, these changes resulting in net loss will register the following changes:

(VII)



The placing of profits and reserves in fixed assets or in capital liabilities would show a trend from Department C to Department A, as indicated in the diagram below.

(VIII)



Stock Dividends Revealed in Comparative Balance Sheets.—Stock dividends result in a reduction of surplus and a corresponding increase in common stock. This change represents the addition of no new values to the firm, and in the last analysis is the result of a bookkeeping entry that converts a surplus amount into a capital stock account. The following cases show a stock dividend together with the identification of the investment of surplus profits and reserves over a period of years.

BALANCE SHEET, DECEMBER 31, 1921

Fixed Assets	$100,000	Capital Stock	$125,000
Current Assets	75,000	Mortgage	50,000
	$175,000		$175,000

BALANCE SHEET, DECEMBER 31, 1926

Fixed Assets	$110,000	Capital Stock	$125,000
Current Assets	100,000	Mortgage	20,000
		Reserve Depreciation	25,000
		Surplus	40,000
	$210,000		$210,000

BALANCE SHEET, JANUARY 1, 1927

Fixed Assets	$110,000	Capital Stock	$155,000
Current Assets	100,000	Mortgage	20,000
		Reserve Depreciation	25,000
		Surplus	10,000
	$210,000		$210,000

On December 31, 1926, the balance sheet showed that compared with 1921 the firm had "invested" its reserve for depreciation $25,000, and its surplus $45,000, as follows:

1. Fixed Assets	$10,000
2. Current Assets	25,000
3. Reduction of Mortgage	30,000
	$65,000

On January 1, 1927, the company declared a stock dividend; the balance sheet showed a reduction of the surplus by $30,000 and an increase in the stock of the same amount. Naturally this was not stock watering as the values represented by the common stock increase was formerly in the surplus, and was reinvested, a part in fixed assets, a part in current assets, and a part in the reduction of the mortgage indebtedness. The former surplus profits reinvested in the business retained their identity in their old form. Where the credit was formerly surplus, it has been changed to common stock.

Operating Deficits.—Operating losses that result in the reductions of surplus, find expression in a reduction of general values either among the physical assets, current or fixed, or the creation of new liabilities, or a combination of these factors. Most often the loss results in an absolute shrinkage in working capital, represented by a reduction of cash, merchandise, or receivables, or an increase in current liabilities; it amounts to an expenditure of values not recovered from income receipts. Physical plant may also be converted into cash which in turn is used up as a result of the deficit, in which case the net reduction will occur in the plant values; or capital liabilities may be created and the values used in operations. (See below.)

	1926	1927
Fixed Assets	$110,000	$110,000
Current Assets	100,000	90,000
Deficit	0	15,000
	$210,000	$215,000
Capital Stock	$155,000	$155,000
Mortgage	20,000	20,000
Loans	0	10,000
Reserve Depreciation	25,000	30,000
Surplus	10,000	0
	$210,000	$215,000

In 1927 the operating loss of $25,000 resulted in a reduction of current assets of $10,000; an increase in loans of $10,000; and an increase in the reserve for depreciation of $5,000. The net working capital was reduced $20,000. The $5,000 included as a part of the deficit is represented by the increase of the depreciation reserve. It amounts to a transfer from the stockholders' equity in property to a valuation reserve. This change results in no net addition to property in any form, for replacement purposes, but simply marks down the value of the fixed assets by an amount suffered by the stockholders, through the depreciation of the assets.

The Trend of Funds Shown by Index Numbers.—A similar report analysis, though less graphically displayed, showing the departmental trend of funds, may be developed with the use of index numbers that show the trend of each balance sheet item, based on the first year's figures. Such an index number analysis worked out for the Western Metal Products Company is given in Figure 8. The year 1925 is taken as a starting point and each succeeding year's index number is based upon that year. The plan is useful for checking the trend of critical items such as cash, receivables, payables, and profits, and furnishes a check on group tendencies. However, it does not feature pointedly the departmental "drift" which is brought out in the preceding illustrations and which gives in summary

WESTERN METAL PRODUCTS COMPANY

	1925	Per Cent Based on 1925 1926	Per Cent Based on 1925 1927
ASSETS			
1. Real Estate	$ 30,000	100%	100%
2. Buildings	45,000	113%	124.4%
3. Goodwill	25,000	100%	100%
4. Machinery	60,000	78.1%	82.5%
Total Fixed Assets	$160,000	96.0%	100.4%
5. Cash	12,150	99.4%	123.4%
6. Accounts Receivable	19,850	75.5%	90.6%
7. Notes Receivable	15,000	120.0%	113.3%
8. Finished Goods	49,500	131.3%	127.2%
9. Raw Materials	10,000	82.5%	90.0%
10. Investments	10,000	250.0%	100%
Total Current Assets	$116,500	123.1%	113.3%
TOTAL ASSETS	$276,500	107.0%	105.0%
LIABILITIES			
1. Common Stock	$100,000	100%	100%
2. Preferred Stock	100,000	100%	100%
3. Bonds Payable	0	*137.5%	*137.5%
Total Capital Liabilities	$200,000	112.5%	112.5%
4. Notes Payable	$ 26,000	7.7%	15.4%
5. Accounts Payable	14,000	107.1%	60.7%
Total Current Liabilities	$ 40,000	42.5%	31.2%
6. Reserve for Depreciation	$ 21,300	137.0%	142.7%
7. Surplus Profits	15,200	163.1%	161.8%
Total Reserve and Surplus	$ 36,500	147.6%	150.7%
TOTAL LIABILITIES	$276,500	107.0%	105.7%

* Nominal percentage to correspond with the total change in capital liabilities.

Figure 8. Comparative Balance Sheet, Showing Trends in Index Numbers

form the net amount of incoming or outgoing funds in the major structural sections of the business.

Non-Fund Changes in Balance Sheets.—Most of the changes in the comparative balance sheets considered thus far in this chapter have involved actual funds, representing trends in tangible values that have substance in the form of real properties and liabilities. There are, however, a large number of changes in balance sheet items found in actual practice, which find their way into the reports that are non-pecuniary in nature. These changes are not "funds" in the strict sense of the word but are the result of bookkeeping entries made in the ledger. They have no real value, and since their presence tends to give an erroneous reading to the source and utilization of funds, it is necessary to determine what these adjustments are, and also in what manner they cause false conclusions regarding the actual changes in the financial structure.

Charges Against Surplus.—For example, the writing off to Surplus or to the current Profit and Loss account of such items as fire losses, organization expenses, goodwill, patents, discount on capital stock, and similar items, gives a false trend of funds in the statements. This is true because normally the reduction in surplus between years is usually assumed to register the fact of dividend payments, or operating losses, when as a matter of fact not one of these changes may have taken place. If the reduction in the surplus came about as a result of mere bookkeeping debits to Surplus, and the corresponding credit to some capital account, a misstatement of the real profits earned and reinvested in the business is shown, due to the fact that the ledger entry charging surplus of itself registers a loss, and cancels a portion or all of the true profit for the period.

Again, the writing up or the appreciating of such items as real estate or other fixed assets, even though the excess value has a real existence, gives a false surplus position because the ledger entry crediting Surplus registers a profit and augments

the operating gain. In both cases where the asset account has been adjusted, either by way of depreciation or appreciation, an untrue statement of asset changes is brought about. Funds do not go into real estate as a result of mere bookkeeping debits, and neither do the intangibles lose dollar values from the credits.

Non-Fund Changes Shown by Ledger Accounts.—A study of the Surplus account over two fiscal periods, where adjustments have been made, writing down the value of the intangibles, will illustrate the point more graphically.

Goodwill Account

Original value	$50,000	Written down and charged to Surplus	$25,000

Surplus Account

Goodwill written down	$ 25,000	Original balance	$ 75,000
Balance	80,000	Current earnings	30,000
	$105,000		$105,000
		Balance down	$ 80,000

If the original value of the goodwill $50,000 had not been written down by $25,000 and charged to Surplus account, the latter would have a balance of $105,000 instead of the $80,000 as shown in the ledger account. The trend of funds here would show only $5,000 coming from the surplus, whereas there should be a representation of the full $30,000 in profits. The source and utilization of funds is thus cancelled in the same way that the showing of assets at their net value without the full showing of depreciation reserves, covers the true trend of funds where there are additions and betterments in the fixed assets.

Or again, take the case of the appreciation of the Real Estate account as illustrated in the following ledger accounts.

Real Estate

Original cash cost	$50,000		
Written up	25,000		

Capital Stock

			$50,000

Current Assets

Old balance	$80,000		
New amount	20,000		

Current Liabilities

			$50,000

Surplus

		Old balance	$30,000
		Current profits	20,000
		Real estate written up	25,000

Real estate here was appreciated $25,000 and the amount credited to the surplus. As actually revealed in the accounts, the current operating profits were reinvested in the current assets. If the ledger was not adjusted to offset the erroneous surplus statement, a false trend of funds would show that the $45,000 contribution from the surplus had been invested in real estate $25,000 and in current assets $20,000.

A specially complex situation arises where a combination of these two bookkeeping entries occurs, one entry writing down the intangibles and the other writing up the physical assets, or where there are adjustments made between assets and their related reserves on the occasion of a sale of property for more or less than book values.

Another change in the funds of a business that does not receive a satisfactory record in the usual comparative balance sheet is the payment of cash dividends out of current profits. An operating gain may be offset by the payment of an equivalent amount of dividends paid out during the year in which the profits were made, an important fact that is not disclosed to the reader of the comparative reports unless the supplemental information is secured from the bookkeeping department.

Working Papers.—With the use of appropriate working papers all non-pecuniary or non-fund changes in comparative balance sheets can be properly adjusted in such a way that the true dollar funds only will be featured. The working papers and ledger accounts illustrated on the following pages show the usual form for analyzing bookkeeping changes and for showing the adjusted source and utilization of funds.

The work sheets which follow are useful for analyzing the trend of funds. Figure 9 illustrates the use of the work sheet without bookkeeping adjustments. Figure 10 illustrates the use of the work sheet with the bookkeeping adjustments necessary to give a true picture of the trend of funds.

The data for the illustration are taken from the following balance sheets:

	1926	1927	Differences
Real Estate	$ 25,000	$ 30,000	+ $ 5,000
Buildings	50,000	60,000	+ 10,000
Inventories	40,000	52,500	+ 12,500
Accounts Receivable	60,000	55,000	− 5,000
Cash	15,000	22,700	+ 7,700
	$190,000	$220,200	+ $30,200
Bonds Payable	$ 30,000	$ 40,000	+ $10,000
Accounts Payable	50,000	55,000	+ 5,000
Capital Stock	75,000	75,000	0
Surplus	15,000	25,000	+ 10,000
Reserves Depreciation	20,000	25,200	+ 5,200
	$190,000	$220,200	+ $30,200

A. B. C. COMPANY. SOURCE AND UTILIZATION OF FUNDS—WORKING PAPERS WITHOUT ADJUSTMENTS

	Dec. 31, 1926	Dec. 31, 1927	Year's Excess		Working Capital Dept. B		Capital Dept. A		Surplus and Reserves—Dept. C	
			Debits	Credits	Increase	Decrease	Utilization	Source	Utilization	Source
ASSETS										
Real Estate	$ 25,000	$ 30,000	$ 5,000				$ 5,000			
Buildings	50,000	60,000	10,000				10,000			
Inventories	40,000	52,500	12,500		$12,500					
Accounts Receivable	60,000	55,000		$ 5,000		$ 5,000				
Cash	15,000	22,700	7,700		7,700					
Totals	$190,000	$220,200								
LIABILITIES AND CAPITAL										
Bonds Payable	$ 30,000	$ 40,000		10,000				$10,000		
Accounts Payable	50,000	55,000		5,000		5,000				
Capital Stock	75,000	75,000								
Surplus	15,000	25,000		10,000						$10,000
Reserves	20,000	25,200		5,200						5,200
	$190,000	$220,200	$35,200	$35,200						
Increase in Working Capital, Dept. B						10,200				
					$20,200	$20,200				
Increase in Capital, Dept. A								5,000		
							$15,000	$15,000		
Secured from Surplus and Reserves, Dept. C									$15,200	
									$15,200	$15,200

Figure 9. Statement of Source and Utilization of Funds—Working Papers Without Adjustments

A. B. C. COMPANY. SOURCE AND UTILIZATION OF FUNDS—WORKING PAPERS. WITH ADJUSTMENTS

	Dec. 31, 1926	Dec. 31, 1927	Year's Excess		Adjustments		Working Capital Dept. B		Capital Dept. A		Surplus and Reserves—Dept. C	
			Debits	Credits	Debit	Credit	Increase	Decrease	Utilization	Source	Utilization	Source
ASSETS												
Real Estate	$ 25,000	$ 30,000	$ 5,000			(1) $ 5,000						
Buildings	50,000	60,000	10,000		(2) $ 2,000				$12,000			
Inventories	40,000	52,500	12,500				$12,500					
Accounts Receivable	60,000	55,000		$ 5,000				$ 5,000				
Cash	15,000	22,700	7,700				7,700					
Totals	$190,000	$220,200										
LIABILITIES AND CAPITAL												
Bonds	$ 30,000	$ 40,000		10,000						$10,000		
Accounts Payable	50,000	55,000		5,000				5,000				
Capital Stock	75,000	75,000										
Surplus	15,000	25,000		10,000		(3) 2,500						(3) $ 2,500
Reserves	20,000	25,200		5,200								5,200
Totals	$190,000	$220,200	$35,200	$35,200								
SURPLUS ADJUSTMENTS												
Real Estate written up (1)				(1) $ 5,000	(1) 5,000							
Fire Loss (Bldg.) written down (2)			(2) $ 2,000			(2) 2,000						
Reserve Adjustment written up (3)				(3) 2,500	(3) 2,500							
Cash Dividends written down (4)			(4) 7,500			(4) 7,500						
Net Profits for 1927 written up (5)				(5) 12,000	(5) 12,000							(5) 12,000
Net Increase (6)			(6) 10,000									
			$19,500	$19,500								
Cash Dividends Paid (4)					(4) 7,500							
Net Profits (5)						(5) $12,000						
					$29,000	$29,000						
Increase in Working Capital, Dept. B								10,200				
							$20,200	$20,200				
Increase in Capital, Dept. A										2,000		
Dividends Paid											(4) 7,500	
									$12,000	$12,000		
Increase Surplus and Reserves, Dept. C											12,200	
											$19,700	$19,700

Figure 10. Statement of Source and Utilization of Funds—Working Papers. With Adjustments

Prior to the adjustments, as recorded in the above comparative balance sheets, the source and utilization of funds show the following:

A. Source of Funds:	
1. Accounts Receivable	$ 5,000
2. Accounts Payable	5,000
3. Surplus	10,000
4. Reserves	5,200
5. Bonds	10,000
	$35,200

B. Utilization of Funds:	
1. Real Estate	$ 5,000
2. Buildings	10,000
3. Inventories	12,500
4. Cash	7,700
	$35,200

The trend of funds shows the following:

From Surplus and Reserves, Department C		$15,200
To Capital Assets, Department A	$ 5,000	
To Working Capital, Department B	10,200	15,200

Ledger Adjustments.—In this illustration all increases and decreases appeared as bona fide changes in the various ledger accounts. However, upon inspection of the ledger it may be noted that the $5,000 increase in the Real Estate account resulted from a bookkeeping entry debiting that account and crediting Surplus; that there was a $2,000 fire loss charged from the Building account to Surplus; that the Reserve for Depreciation, which had been previously overstated, was closed into (credited) Surplus, the amount being $2,500; that profits earned amounted to $12,000; and that a cash dividend of $7,500 was paid.

The bookkeeping Surplus and Reserve accounts showed the following:

SURPLUS ACCOUNT

Fire Loss, 1927	$ 2,000	Balance, Dec. 31, 1926	$15,000
Dividends, 1927	7,500	Real Estate written up 1927	5,000
Balance, 1927	25,000	Profits, 1927	12,000
		Adjustments with Reserve, 1927	2,500
	$34,500		$34,500
		Balance forward, Dec. 31, 1927	$25,000

DEPRECIATION RESERVE ACCOUNT

Carried to Surplus 1927	$ 2,500	Balance, Dec. 31, 1927	$20,000
Balance, Dec. 31, 1927	25,200	1927 Credit	7,700
	$27,700		$27,700
		Balance forward, Dec. 31, 1927	$25,200

The Surplus account indicates a nominal increase of $10,000, presumably due to the 1927 profits. But deducting the non-fund items, including the reserve adjustment, the real increase in the surplus amounted to only $4,500, instead of $10,000, and the actual increase in the reserve was $7,700 instead of $5,200. By showing the earned profits of $12,000 as an additional source of funds, and the utilization in the form of dividends of $7,500, a revised trend of funds statement shows as follows:

A. Source of Funds:	
1. Accounts Receivable	$ 5,000
2. Accounts Payable	5,000
3. Profits	12,000
4. Reserves	7,700
5. Bonds	10,000
	$39,700

B. Utilization of Funds:

1. Dividends	$ 7,500
2. Buildings	12,000
3. Inventories	12,500
4. Cash	7,700
	$39,700

The net trend of funds, which shows the structural changes, is as follows:

From Surplus and Reserves, Department C		$12,200
To Capital Assets, Department A	$ 2,000	
To Working Capital, Department B	10,200	12,200

This trend is at variance with the one shown prior to the adjustments.

Comparative Balance Sheet of a Going Concern.—The following analysis of the comparative balance sheet of The Diamond "D" Manufacturing Company gives in detail the report of a going concern. It shows the increases and decreases in each balance sheet item (pages 93 and 94); also, the major trend of funds within the financial structure. The report (page 96) indicates the capital financing, the working capital financing and changes in profits and reserves for the year.

The Investment of Surplus and Reserves Report (page 97) gives a detailed statement of how the firm reinvested its operating profits and reserves in the various assets and liabilities during the year 1927. It shows in a graphical way why the profits for the period are not represented in the cash balance.

By identifying the exact position of the profit and reserves "money," in the financial structure, the financial manager and the directors will be in a better position to determine the dividend policies, to plan the operating budgets and the expenditures for capital assets. (See Chapter XXII.)

THE DIAMOND "D" MANUFACTURING COMPANY
COMPARATIVE GENERAL BALANCE SHEET
At December 31, 1926, and December 31, 1927

	December 31, 1926	December 31, 1927	+ Increase	− Decrease
ASSETS AND DEFERRED DEBIT ITEMS				
CAPITAL ASSETS:				
Land	$ 57,157.00	$ 57,157.00		
Factory and Office Buildings	70,990.44	70,990.44		
Building Equipment	13,105.41	13,439.27	$ 333.86	
Power Plant	15,904.02	16,404.43	500.41	
Machinery and Tools	36,050.74	39,471.77	3,421.03	
Experimental and Improvement Plan	3,472.03	3,481.21	9.18	
Maintenance Plant	6,218.84	6,312.06	93.22	
Printing Plant	669.25	669.25	0	
Transportation Plant	5,769.68	7,329.01	1,559.33	
Furniture and Fixtures	4,369.96	4,654.94	284.98	
Trade-Marks and Patents	2,382.78	2,692.02	309.24	
Total Capital Assets	$216,090.15	$222,601.40	$ 6,511.25	
WORKING AND TRADING ASSETS:				
Working:				
Goods in Process—Inventory	$ 12,388.04	$ 10,299.68		$ 2,088.36
Manufacturing Materials and Supplies—Inventory	26,555.65	36,653.27	$10,097.62	
Materials for Repairs and Maintenance—Inventory	3,953.60	6,350.65	2,397.05	
Scrap Material—Inventory	218.86	257.22	38.36	
Shipping Material—Inventory	114.78	220.19	105.41	
Coal, Oil, and Waste—Inventory	97.00	97.30	.30	
Advertising Matter	11,251.97	10,473.33		778.64
Stationery and Printing	50.56	55.70	5.14	
Total Working Assets	54,630.46	64,407.34	12,643.88	2,867.00
Trading:				
Finished Goods—Inventory	56,631.05	53,651.11		2,979.94
TOTAL WORKING AND TRADING ASSETS	$111,261.51	$118,058.45	$12,643.88	$ 5,846.94
TOTAL CAPITAL, WORKING AND TRADING ASSETS	$327,351.66	$340,659.85	$19,155.13	$ 5,846.94

THE DIAMOND "D" MANUFACTURING COMPANY
COMPARATIVE GENERAL BALANCE SHEET—(Continued)

	December 31, 1926	December 31, 1927	+ Increase	− Decrease
CURRENT ASSETS:				
Cash in Banks and in Office	$ 1,865.61	$ 18,773.15	$16,907.54	
Special Deposits	11,093.23	14,690.40	3,597.17	
Notes Receivable		1,000.00	1,000.00	
Customers' Accounts Receivable	39,588.75	53,376.04	13,787.29	
Claims against Transportation Cos.	529.08	732.32	203.24	
Advances to Employees	951.57	589.08		$ 362.49
Total Current Assets	54,028.24	89,160.99	35,495.24	362.49
DEFERRED DEBIT ITEMS:				
Fire Insurance Premiums, unexpired portion	1,583.33	1,411.85		171.48
Freight and Cartage Outward, applicable to goods finished, warehoused and unsold		3,670.46	3,670.46	
Total Deferred Debit Items	1,583.33	5,082.31	3,670.46	171.48
TOTAL CURRENT ASSETS AND DEFERRED DEBIT ITEMS	$ 55,611.57	$ 94,243.30	$39,165.70	$ 533.97
TOTAL ASSETS AND DEFERRED DEBIT ITEMS	$382,963.23	$434,903.15	$58,320.83	$ 6,380.91
LIABILITIES AND SURPLUS				
CAPITAL LIABILITIES:				
Capital Stock Authorized, Issued and Outstanding	$ 50,000.00	$ 50,000.00		
Real Estate Bond and Mortgage	109,100.00	98,300.00		$10,800.00
Total Capital Liabilities	159,100.00	148,300.00		10,800.00
CURRENT LIABILITIES:				
Notes and Loans Payable	31,700.00	18,749.96		12,950.04
Accounts Payable:				
a. To Creditors	8,953.12	1,581.79		7,371.33
b. Employees—Wages Accrued	774.82	10,717.24	$ 9,942.42	
c. To Salesmen—Salaries, Commissions and Expenses	1,182.20	3,588.19	2,405.99	
d. To Employees — Profit Sharing Scheme	9,689.28	734.79		8,954.49
e. To Employees—Deposits for Use of Tools	10.75	63.58	52.83	
f. To State—For Taxes		1,116.12	1,116.12	
Total Current Liabilities	52,310.17	36,551.67	13,517.36	29,275.86
TOTAL LIABILITIES	$211,410.17	$184,851.67	$13,517.36	$40,075.86

THE DIAMOND "D" MANUFACTURING COMPANY
COMPARATIVE GENERAL BALANCE SHEET—(Continued)

	December 31, 1926	December 31, 1927	+ Increase	− Decrease
SURPLUS:				
a. Appropriated:				
For Reserves for Claims against Transportation Companies	$ 184.75	$ 569.73	$ 384.98	
For Reserves for Depreciation of Physical Assets		9,481.39	9,481.39	
For possible Losses of Accounts Receivable		2,715.34	2,715.34	
Total Appropriated	184.75	12,766.46	12,581.71	
b. Available for Dividends	171,368.31	237,285.02	65,916.71	
TOTAL SURPLUS AND RESERVES	171,553.06	250,051.48	78,498.42	
TOTAL LIABILITIES AND SURPLUS	$382,963.23	$434,903.15	$92,015.78	$40,075.86

SOURCE AND UTILIZATION OF FUNDS BY MAJOR GROUPS

SOURCES:

1. Current Liabilities Increased	$13,517.36	
2. Decrease Current Assets	533.97	
3. Reinvestment of Profits and Reserves	78,498.42	$92,549.75

UTILIZATION:

1. Reduction Fixed Liabilities	$10,800.00	
2. Reduction Current Liabilities	29,275.86	
3. Increased Fixed Assets	6,511.25	
4. Increase Working and Trading Assets	6,796.94	
5. Increase Current Assets	39,165.70	$92,549.75

Trend of Funds

The Diamond "D" Manufacturing Company

Changes in Assets and Liabilities by major groups, 1926–1927

A.—Capital Group

1. Fixed Assets Increased	+$ 6,511.25
2. Fixed Liabilities Decreased	− 10,800.00
Total Investment in Capital Group	$17,311.25

B.—General Balance Sheet

1. Working Assets Increased	$ 9,776.88	Current Liabilities Reduced	$29,275.86
2. Current Assets Increased	35,132.75	Current Liabilities Increased	13,517.36
3. Deferred Items Increased	3,498.98	Total Net Investment in Liabilities (Current)	$15,758.50
	$48,408.61		
4. Trading Assets Decreased	2,979.94		
Total Net Investment in Working Assets	$45,428.67		

C.—Profits and Reserves

Profits		$65,916.71
Reserves		12,581.71
Total		$78,498.42
Net Investment in Capital Group		$17,311.25
Net Investment in Working Capital:		
Net Current and Working Assets Increased	$45,428.67	
Net Current and Working Liabilities Reduced	15,758.50	61,187.17
Source—Profits and Reserves		$78,498.42

Recapitulation—Investment of Surplus and Reserves, 1927

A.—Reduction of Liabilities:				
1. Fixed:				
a. Real Estate Bond and Mortgage				$10,800.00
2. Current Liabilities Decreased:				
a. Notes and Loans Payable		$12,950.04		
b. Accounts Payable		7,371.33		
c. Employees' Profit Sharing		8,954.49	$29,275.86	
3. Less Current Liabilities Increased:				
a. Accrued Wages		$ 9,942.42		
b. Accrued Salesmen's Salaries		2,405.99		
c. Deposits on Tools		52.83		
d. Accrued Taxes		1,116.12	13,517.36	15,758.50
Total Decrease in Liabilities				$26,558.50
B.—Increase in Assets:				
1. Fixed Assets:				
a. Building Equipment		$ 333.86		
b. Power Plant		500.41		
c. Machinery and Tools		3,421.03		
d. Maintenance Plant		93.22		
e. Experimental Plant		9.18		
f. Transportation Plant		1,559.33		
g. Furniture and Fixtures		284.98		
h. Trade-Marks		309.24	$ 6,511.25	
2. Working and Trading Assets:				
a. Materials Inventory		$10,097.62		
b. Repairs Materials		2,397.05		
c. Scrap Materials		38.36		
d. Shipping Materials		105.41		
e. Coal, Oil and Waste		.30		
f. Stationery and Printing		5.14		
		$12,643.88		
Less:				
a. Goods in Process		2,088.36		
b. Advertising		778.64		
c. Finished Goods		2,979.94		
		$ 5,846.94	6,796.94	
3. Current Assets and Deferred Charges:				
a. Cash		$16,907.54		
b. Special Deposits		3,597.17		
c. Notes Receivable		1,000.00		
d. Accounts Receivable		13,787.29		
e. Railroad Claims		203.24		
f. Out-Freight Prepaid		3,670.46		
		$39,165.70		
4. Less Decreases Current Assets:				
a. Advances to Employees	$362.49			
b. Fire Insurance	171.48	533.97	38,631.73	
TOTAL INCREASE IN ASSETS				51,939.92
TOTAL INCREASE IN SURPLUS AND RESERVES, 1927				$78,498.42

CHAPTER VI

CONTROL OVER SOLVENCY—BALANCE SHEET RATIOS

Recapitulation of Solvency Controls.—Up to the present point the following analytical technique covering control over solvency has been developed:

1. The method for determining the amount of the owners' investment in the business and the ratio of the owners' compared with the creditors' equity, i.e., the strength of the foundation for carrying the superstructure of credit.

2. The method for determining the relative amounts of funded or long-term debt to the more volatile current debt, i.e., the type of credit superstructure as revealed through the ratio of fixed liabilities to current liabilities.

3. The method for determining the debt-paying capacity, i.e., the ability to meet debts as revealed through the ratio of current assets to current liabilities and the ratio of quick assets to current liabilities.

4. The method for determining the manner of financing fixed assets in a new concern as revealed through the ratio of fixed assets and intangibles to capital liabilities.

5. The method for determining general retrogression in earnings as revealed in comparative balance sheets.

6. The method for determining general unfavorable tendencies in the financial structure as revealed in the "trend of funds" report, more particularly as applied to the depletion of working capital, the incorrect financing of capital expenditures, the replacement of property, and the payment of dividends and operating losses.

7. The method for determining the general favorable tendencies in the financial structure as applied to the correct financing of capital expenditures and the conservation of working capital.

Additional Insolvency Hazards.—We now come to a series of business hazards or business troubles, indirectly causing insolvency, the control over which lies partly in balance sheet reports and partly in functional officers' operating reports. These hazards may be enumerated as follows:

1. Over-investment in outstanding accounts resulting from too large extensions of credit to customers and poor collections, the effect of which ties up liquid funds, causes financial strain, and increases the overhead expenses.

2. Over-investment in raw materials, goods in process, and finished goods, the effect of which is to tie up liquid funds, lower the debt-paying capacity, and to increase the overhead costs through an increase in interest expenses.

3. Over-investment in plant, which causes a lessened return on the owners' investment due to the greater increase in productive outlay and a less than proportionate increase in volume of business and net profits.

4. Insufficient investment on the part of the owners in working capital, which results in impaired credit standing, inability to pay debts at maturity, and in extreme cases, ultimate insolvency of the business.

These hazards will be briefly discussed here together with an outline of the standard and records technique used for controlling them from the accounting and statistical standpoint.

Over-Investment in Receivables.—The technique required for determining the normal amount of accounts receivable, the amount of delinquencies and their average age, is more elaborate than can be developed in a short paragraph and is reserved for a later chapter.[1] Suffice it to state here that some reliable check is needed for determining whether or not the open accounts are over-extended and contain increasingly large amounts of overdue accounts.

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[1] For an extended discussion of control over the credit and collections, see Chapter XII.

Expansion of Receivables and the Liquidity Ratio.—Sight must not be lost of the fact at the outset that the liquidity ratio is not always a safe index of debt-paying capacity. In fact, an improving liquidity ratio may be caused by an increase in the amount of accounts receivable, the average age and the delinquency of which are becoming steadily worse. In short, an improvement in the liquidity ratio may be an indirect measure of the volume of dead timber in accounts receivable carried by the firm.

The so-called improvement in the ratio is brought about by the addition of gross profits in accounts receivable (in addition to the cost of sales) with a less than proportionate increase in wholesale credit used to carry the self-same receivables. The write-up on sales is charged (debited) to receivables, and the credit is carried to profits, an account which is not a portion of working capital credits, with the result that the liquidity ratio is falsely supported on assets that have a doubtful value.

GRAND RAPIDS FURNITURE, INC.

December 31

	1924	1925	1926	1927
Cash	$12,475	$ 13,562	$ 11,476	$ 11,891
Merchandise	29,746	32,746	30,849	32,432
Accounts Receivable	52,175	61,548	72,459	78,432
Total Assets	$94,396	$107,856	$114,784	$122,755
Accounts Payable	$14,749	$ 15,749	$ 13,982	$ 14,989
Notes Payable	20,763	21,436	22,434	23,432
Total Liabilities	$35,512	$ 37,185	$ 36,416	$ 38,421
Working Capital	$58,884	$ 70,671	$ 78,368	$ 84,334
Liquidity Ratio	2.66 to 1	2.90 to 1	3.15 to 1	3.19 to 1

The accumulation of these fictitious open accounts results in another form of "window dressing,"[2] and has the same effect in making an erroneous liquidity ratio as the making of false sales and unearned profits. For example, the balance sheet figures shown on the preceding page, outwardly reflect a progressive position so far as the liquidity ratio is concerned.

But if upon analysis the accounts receivable are scaled down by the elimination of the overdue and delinquent accounts, a different condition is revealed as shown in the following illustration:

GRAND RAPIDS FURNITURE, INC.

December 31

	1924	1925	1926	1927
Cash	$12,475	$13,562	$11,476	$ 11,891
Merchandise	29,746	32,746	30,849	32,432
Accounts Receivable	47,462	44,743	53,746	57,895
Total Assets	$89,683	$91,051	$96,071	$102,218
Accounts Payable	$14,749	$15,749	$13,982	$ 14,989
Notes Payable	20,763	21,436	22,434	23,432
Total Liabilities	$35,512	$37,185	$36,416	$ 38,421
Revised Working Capital	$54,171	$53,866	$59,655	$ 63,797
Revised Liquidity Ratio	2.52 to 1	2.45 to 1	2.64 to 1	2.66 to 1

Instead of an improvement of 20% in the liquidity ratio position, the actual change was scarcely 6%, or less than one-third of the reported change.

Ratio of Account Sales to Receivables.—The following primary measuring device is customarily used as a check upon the liquidity ratio, viz., the ratio of account sales to accounts receivable in "fiscal" and in comparative reports. The bad debts reserve will serve as such a check on the liquidity ratio, but no basis is ordinarily given for knowing the method of computing the bad debts allowance. The net sales of the Grand Rapids Furniture, Inc., from 1924 to 1927, inclusive, were $308,492, $334,305, $376,786 and $391,591, respectively, The ratio of sales to receivables (the measure of receivables turnover), before scaling down shows:

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[2] See Chapter III.

1924	1925	1926	1927
$\frac{\$308,492}{52,175} = 5.91$	$\frac{\$334,305}{61,548} = 5.43$	$\frac{\$376,786}{72,459} = 5.20$	$\frac{\$391,591}{78,432} = 4.99$

This record shows a degressive tendency in the sales to receivables ratio which checks with the actual facts in the case. The declining ratio of sales to receivables denotes a slower turnover of the open accounts. It indicates more liberal credit terms, but possibly more delinquent collections, a condition that should be taken into account at all times when the liquidity ratio is being considered. A liquidity ratio registers improvement only when the receivables consist of live accounts and are not padded by delinquencies.

If the collections were more prompt and the accounts scaled down by the elimination of the overdue amounts, the ratio of sales to receivables of the Grand Rapids Furniture, Inc., would have shown the following:

1924	1925	1926	1927
$\frac{\$308,492}{47,462} = 6.50$	$\frac{\$334,305}{44,743} = 7.47$	$\frac{\$376,786}{53,746} = 7.01$	$\frac{\$391,591}{57,895} = 6.76$

This condition is practically the reverse of that shown above. The accumulation of overdue accounts lowers the sales to receivables ratio, but increases the liquidity ratio; the writing off the overdue accounts to surplus improves the sales to receivables ratio, but lowers the liquidity ratio. The two ratios should be taken together in featuring the debt-paying capacity of a business, and the tendency to over-investment in open accounts.

Modifications in Sales Ratio.—There are certain business factors that tend to militate against the use of the ratio of sales to receivables as control technique over receivables. They are: (1) seasonal sales, a large portion of which may be made just prior to the closing date, a condition in itself that would result in a more than proportionate amount of outstanding accounts compared to sales; (2) a change in credit terms granted to customers, the effect of which would tend to alter the amount of trade accounts outstanding one year or one month compared with another; (3) increases in the gross profit rate on goods sold, which, if made a short time prior to the closing date, would be reflected in increased accounts receivables, without a proportionate increase in the annual sales, as the receivables would carry the increased mark-up, whereas a large proportion of sales for the year would be made at the lower price; (4) the taking of more sales discounts by customers in one period than in another, which indicates (a) more prompt payments, and, more important, (b) a smaller amount of outstanding accounts than normally would be the case where less discounts were taken.

Effect of Sales Discounts on Average Age.—Neither the average day's sales outstanding nor the ratio of sales to receivables in one period compared with another can be used for detecting the average age of open accounts where the amount of sales discounts varies between periods. For example, in a given case where there is an increase in the number of discount customers (measured by the amount of sales discounts taken compared with the total sales discounts allowed), the number of accounts that are running the full net credit time is less than in the case where there are no discounts taken. The greater the number of customers taking discounts, the smaller should be the normal outstanding accounts at any given time. If the turnover of receivables or the number of days' sales outstanding remains the same between periods, but the amount of sales discounts shows an increase, the average age (delinquency) of the accounts has increased and there is a larger amount of dead timber in the accounts.

Therefore, for control purposes the ratio of sales to receivables must be modified by the sales discount factor, which means that a wholly different scheme for measuring over-investment in receivables must be used; for if the turnover of the receivables remains the same one year with the next, but the actual discounts taken compared to total discounts allowed during the same period show an increase, the comparative figure of sales to receivables is erroneous and altogether misleading.

	1924	1925	1926	1927
1. Net Sales (terms 1% 15 da. n/60)	$745,649.00	$787,432.00	$842,316.00	$822,763.00
2. Theoretical Normal Days' Sales Outstanding	60	60	60	60
3. Theoretical Normal Receivables Outstanding	$124,274.00	$131,238.00	$140,386.00	$137,127.00
4. Actual Accounts Outstanding	$132,549.00	$148,560.00	$155,329.00	$148,625.00
5. Actual Days' Sales Outstanding	64	68	66	65
6. Actual Turnover of Receivables	5.625	5.310	5.425	5.530
7 Potential Sales Discounts (1% 15 da.)	$ 7,456.49	$ 7,874.32	$ 8,423.16	$ 8,227.63
8. Actual Discounts taken	$ 4,101.07	$ 4,722.59	$ 5,643.52	$ 6,006.17
9. Per Cent of Customers taking Discounts	55%	60%	67%	73%
10. Amount of Delinquent overdue accounts*	$ 76,625.70	$ 96,064.80	$109,001.62	$111,600.71
11. Actual recomputed average age of outstanding accounts in days	142	169	201	240
12. Average age as measured (See #5 above)	64	68	66	65
13. Error in Days	78	101	135	175

* Ignoring sales made in last 15 days.

Figure 11. Showing Error in Receivables Turnover and Days' Sales Outstanding Where Customer Discounts Are Taken

(See Chapter XII for method of computation.)

The only true method of determining the over-investment in receivables is to compute the average age of the accounts.[3] Without this computation the error is directly proportional to the amount of sales discounts taken by customers. By way of illustration, Figure 11 shows to what extent the factor of sales discounts will disturb the ordinary conclusions regarding the turnover of receivables and the days' sales outstanding. By referring to this illustration it will be noted that for the years 1924 to 1927, inclusive, the turnover rates of receivables to sales according to the usual method of turnover computations were as follows:

1924	5.625	receivables	turnover
1925	5.310	"	"
1926	5.425	"	"
1927	5.530	"	"

and the days' sales outstanding as follows:

1924	64	days'	sales
1925	68	"	"
1926	66	"	"
1927	65	"	"

whereas by recomputing the days' sales figure in the light of the discounts taken, the actual average age was as follows:

1924	142	average	age	in	days
1925	169	"	"	"	"
1926	201	"	"	"	"
1927	240	"	"	"	"

or errors in these periods of 122%, 149%, 204%, and 270%, respectively.

Where discounts are taken by customers, as indicated by the sales discounts, neither the turnover method nor the outstanding days' sales method are usable for control purposes.

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[3] See Chapter XII.

This illustration represents an extreme case, but shows the possibility of errors in such an analysis.

Over-Extension of Inventories.—The carrying of excess merchandise stock, raw materials, factory supplies, goods in process, and miscellaneous inventories requires extra capital or credit, or both, and may lead to insolvency if the values tied up in such items cannot be liquidated in time to meet the debts incurred to carry these extra inventories.

If frozen inventories do not turn into cash rapidly enough, they are no more available for meeting current indebtedness than are the actual plant and equipment. If the inventory department shows a tendency to expand as the volume of business grows, an additional burden will be thrown upon the financial management because of the necessity of securing additional long-term financing. This financing must follow if wholesale terms are not lengthened to accommodate the slower turnover of the inventories, a condition very rarely met, especially if the business is that of manufacturing.

Excess inventories that accumulate through mismanagement, in addition to requiring new financing, are expensive properties to carry because of the added depreciation, taxes, and interest cost on the extra capital outlay required for the storage space; and because of the carrying costs, such as taxes, insurance, shrinkage, heat, light, etc., on the excess goods themselves. Savings as high as 2% on the invested capital have been realized where inventories have been scaled down to workable limits, justified by closer supervision over buying, processing, and selling.

Excess Inventories and the Liquidity Ratio.—Finished goods, raw materials, and goods in process if allowed to accumulate unduly, while giving a "favorable" balance sheet liquidity ratio, may be the reason for acute financial stringency in a firm. The two antithetical conditions are entirely possible, for the reason explained previously, that large amounts of receivables may cause a satisfactory current ratio, but at the same time may register an unsatisfactory sales to receivables ratio. Since modern business is being conducted more and more on smaller and faster turning merchandise stocks, the reader of balance sheets and the manager seeking more perfect internal control over the capital tied up in "frozen" stock-in-trade, should have a ready technique for detecting overstocking of goods as revealed in the reports.

Internal Checks Over Inventories.—"Dead timber" in commercial inventories may be detected by a comparison of the merchandise turnover rate over a period of years. A slow turnover connotes heavy inventory compared to trade needs; a faster turnover connotes lighter inventories. However, no measurement save the actual check on individual lines of goods and a process for "aging goods," will detect the dangerous increase in "dead timber" merchandise until its amount has assumed rather large proportions. A comparison of merchandise turnovers will not detect the condition quickly enough. Often a slow turnover will be attributed by management to poor selling for the current season, and attention directed to that field, when the slow turn in fact may be registering the cumulative effects of a number of seasons of "poor buying." For internal purposes some intimate control over stock, through perpetual inventory systems, maximum limits, or some similar device, should be used.

Ratio of Sales to Inventory.—A secondary check on the tendency toward over-investment in inventories may be found in a comparison of sales with the average inventory.[4] By taking the ratio of the average inventory to sales and also to cost of sales in the Grand Rapids Furniture, Inc., case below, the effect of cumulative inventories can readily be detected in the balance sheet report.

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[4] The ratio of sales to inventory offers but little information not found in ratio of cost of sales to inventory.

GRAND RAPIDS FURNITURE, INC.

1924–1927

Year	Average Inventory	Sales	Per Cent of Sales to Inventory	Cost of Sales	Per Cent of Cost of Sales to Inventory
1924	$34,156	$308,492	903%	$205,662	602%
1925	38,575	334,305	867	222,870	578
1926	47,824	376,786	788	251,191	525
1927	50,179	391,591	780	261,061	520

Here the actual inventory, the sales, and cost of sales show increases, but the inventory shows a greater increase than sales, or cost of sales, a condition that indicates a larger volume of business, but on an inventory out of proportion to the business done.

The decline in both the ratio of sales to inventory and the ratio of cost of sales to inventory indicates an obvious tendency to over-investment in merchandise. This may be due to lack of correlation between the buying, the production, and the selling departments, or it may be due to the overstocking of goods occasioned by a change in demand that could not be foreseen and controlled.

GRAND RAPIDS FURNITURE, INC.

1924–1927

Year	Inventory Scaled to Replacement Values	Sales	Per Cent of Sales to Inventory	Cost of Sales	Per Cent of Cost of Sales to Inventory
1924	$29,746	$308,492	1037%	$205,662	691%
1925	32,746	334,305	1022	222,870	681
1926	30,849	376,786	1221	251,191	814
1927	32,432	391,591	1207	261,061	805

The illustration above shows the effect of scaling the inventories of the Grand Rapids Furniture, Inc., to replacement values during the same years. The results show in sharp contrast the effect of keeping down the inventories upon the turnover rates and sales to inventory ratios.

CONCLUSIONS.—1. In order to show a healthy inventory sign, the ratios of sales and cost of sales to inventories should be fairly constant; improvement would be registered in increasing ratio of sales and the cost of sales to the average inventory figures. Lack of progress and over-investment shows in a decline of the ratios. However, in many cases the decline in the ratios may be a normal condition and may indicate merely the fact that larger merchandise stocks are being carried as a matter of trade requirements for a given sales volume.

2. In practically all cases, however, the slowing up of the turnover figures gives a reliable check on inventory troubles, and should be heeded especially if the trend is progressively downward.

3. The turnover of separate lines of goods within departments should be studied where practicable, to control adequately the investment in inventories.

4. It should be noted that for comparative purposes the sales to inventory ratios may be vitiated by changes in the mark-up on sales. For this reason the cost of sales to inventory may be used more effectively. However, it must also be noted that errors in bookkeeping for purchases, and errors in inventory values will enter into the situation and create serious disturbance in ratio computations.

Turnover of Total Inventories.—Another verification of cumulating inventories may be secured by noting the turnover of total inventories which shows whether the investment in the working department as a whole is tending to become over-extended. Progress is found in increased rates of turnover; lack of progress in a decreased rate of turnover. This standard plan may be readily checked by referring to the case of the Acme Furnace Company below:

Acme Furnace Company

December 31.

	1925	1926	1927
Inventories, January 1:			
Raw Materials and Supplies	$ 38,948	$ 37,462	$ 42,199
Goods in Process	13,528	14,742	15,100
Finished Goods	47,630	49,550	53,749
	$100,106	$101,754	$111,048
Inventories, December 31:			
Raw Materials	$ 37,462	$ 42,199	$ 38,431
Goods in Process	14,742	15,100	14,915
Finished Goods	49,550	53,749	50,684
	$101,754	$111,048	$104,030
Totals, January 1, and December 31	$201,860	$212,802	$215,078
Average Inventories	100,930	106,401	107,539
Cost of Sales	533,184	643,908	698,432
Turnovers	5.28	6.05	6.495

Ratio of Quick Assets to Current Liabilities.—A third verification of over-extended stock-in-trade may be found by comparing two other ratio trends, viz.: (1) the ratio of cash plus accounts receivable (quick assets in a going concern) to current liabilities, and (2) the ratio of current assets to current liabilities. The following ratios indicate the effect of cumulating inventories which may or may not be in liquid form. The quick assets to liabilities ratio shows a fairly constant trend, whereas the ratio of current assets to current liabilities shows a rapid increase.

Ratio of Quick Assets to Current Liabilities		Ratio of Current Assets to Current Liabilities	
1924	1.82	1924	4.29
1925	1.93	1925	4.75
1926	2.10	1926	5.80
1927	2.05	1927	6.20

The element found in the second ratio but not present in the first is the merchandise stock; and since the inclusion of the inventory has resulted in the pronounced increase of current assets to current liabilities in the ratio trend, the inference may be drawn that the increasing amount of stock is the direct cause for the increased liquidity ratio.

This check should be made in conjunction with the sales to inventory ratio or the merchandise turnover figure, because increasing inventories as indicated by the ratio of current assets to current liabilities, may result from an improved volume of sales and not from the mere fact of the over-extension in unsalable merchandise stock. The over-extended inventories will be reflected in a faster increase in the liquidity ratio as compared with the increase in the ratio of quick assets to current liabilities; the verification of the condition is found in a declining ratio of sales to inventory.

Over-Investment in Raw Materials, Goods in Process, and Factory Supplies.—The over-investment in materials used for production may be detected by comparing the monthly perpetual (or average) inventories with sales or cost of sales. However, a closer correlation exists between the raw materials used and the average inventory of raw materials on hand. The requisitions for primary and secondary materials by all departments, ascertained by an inspection of requisitions reports (or the old inventory of materials plus purchases minus the final inventory of materials), gives the total materials used in the factory. The average inventory of materials divided into the materials used gives the rate of turnover of raw materials. Progress would be shown where the rate of turnover increases. It is considered unwise to take a composite turnover if many lines of materials are used. The turnover of each particular line should be determined for purposes of control over investment in the raw materials inventory. This rule should be applied also to finished goods as well. In some instances a slower rate of turnover might be justified where large supplies are purchased to avoid rising costs.

The turnover of goods in process may best be computed by dividing the average goods in process into total manufacturing costs. As all items of cost, such as raw materials, direct labor, and overhead factory expenses, pass through the Work in Process account, the rate of turnover of the goods in the machines, on the factory floor, and on the way to the finished warehouse, may be found by a direct comparison of the goods in process inventory to manufacturing costs.[5] The faster the turnover, on a stated volume of production, the less is the investment and the carrying costs. Where the turnover of all inventories is desired, the goods in process with the other inventories of raw materials and finished goods is compared with the cost of sales.

Wherever a turnover of inventories is calculated, the average of all monthly inventories should be used if possible, because of the fact that the final inventory in the current report may be above or below the average monthly figure, due to seasonal variations.

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[5] The turnover of work in process may be computed as follows:

Inventory Goods in Process, January 1	$ 10,000
Direct Labor for year	45,000
Materials used for year	65,000
Burden Costs	45,000
Total Factory Costs	$165,000
Inventory Process, December 31	12,000
Manufacturing Costs	$153,000
Average Goods in Process Inventory	11,000

Turnover $\frac{153,000}{11,000} = 13.9$ times

CHAPTER VII

CONTROL OVER SOLVENCY—BALANCE SHEET RATIOS (CONTINUED)

Turnover of Working and Trading Assets.—All current assets may be divided into two parts, namely: (1) working assets, or those employed in processing, such as raw materials, goods in process, and factory supplies; and (2) trading assets, or those employed in merchandising, such as finished goods, accounts and notes receivable, cash, petty cash and secondary cash reserves, and miscellaneous items that will within a relatively short time be turned into cash. The turnover of these two groups is found by dividing the total net sales for the year by the average current assets employed for the year.[1] As a measure of efficiency in the employment of company funds in all current assets as a group, also in checking the tendency toward over-investment of funds in current assets, the turnover of working and trading assets may be used.

Turnover of Working Capital.—The turnover of working capital is of limited value as a measure of efficiency because of the fact that this inner fund, which is merely the difference between the current assets and the current liabilities, is relatively constant and does not vary with the volume of business as does the total amount of working and trading assets.

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[1] This measure which is commonly employed in current writings (see Lough, Business Finance) is subject to criticism in that the numerator (sales), is not on the same basis as the raw materials, finished goods, and process inventories. The only element in the current assets that is on a cost-plus basis is accounts receivable; all other items are carried at cost. The turnover figure will be a different one if the major portion of the assets consists of receivables compared with inventories. Large inventories compared with receivables will give a faster turnover; large receivables compared with inventories will give a slower turnover.

ACME FURNACE COMPANY

	Dec. 31, 1925	Dec. 31, 1926	Dec. 31, 1927
CURRENT ASSETS:			
Cash	$ 8,432	$ 9,575	$ 12,560
Petty Cash	175	175	175
Notes Receivable—Less Discounted Notes	8,540	9,380	10,850
Accounts Receivable—Less Reserve	48,329	52,650	68,397
Accrued Interest	75	105	121
Raw Materials	38,948	37,462	42,199
Goods in Process	13,528	14,742	15,100
Finished Goods	47,630	49,550	53,749
Temporary Investments	10,000	8,500	11,300
Total Current Assets	$175,657	$182,139	$214,451
CURRENT LIABILITIES:			
Notes Payable	$ 17,375	$ 16,430	$ 15,475
Bank Loans	10,450	9,380	40,500
Accounts Payable	38,432	41,749	42,643
Accruals	4,960	5,015	5,115
Total Current Liabilities	$ 71,217	$ 72,574	$103,733
NET WORKING CAPITAL	$104,440	$109,565	$110,718
Liquidity Ratio	2.46 to 1	2.50 to 1	2.06 to 1
TURNOVER COMPUTATION CURRENT ASSETS:			
Annual Sales	$677,480	$704,885	$873,040
Total Current Assets	175,657	182,139	214,451
Rate of Turnover	3.85	3.87	4.07
TURNOVER COMPUTATION WORKING CAPITAL:			
Annual Sales	$677,480	$704,885	$873,040
Working Capital	104,440	199,565	110,718
Rate of Turnover	6.48	6.43	7.88

Figure 12. Showing Turnover of Current Working and Trading Assets

The working capital very often has little direct relationship to the volume of sales and the volume of production. On the other hand, the total current assets necessarily bear a direct relationship to the total values handled in the processing and trading departments. The lack of correlation between working capital and sales volume is well illustrated in Figure 12. The turnover figures of total current assets measured by the sales in 1925, 1926, and 1927 were, respectively, 3.85, 3.87, and 4.07. These figures indicate an improvement of slightly more than 6% from 1925 to 1927 in the ratios. The assets increased as the amount of business increased, but at a lesser rate.

But if the turnover of the working capital from 1925 to 1927—which registered a turnover of 6.48, 6.43, and 7.88, respectively—is taken for control purposes, a totally different answer results. The cause for the serious discrepancy between the turnover of current assets and the turnover of working capital is found in the fact that while the net inside investment by the owner in current assets in this department remained practically stationary, the total credit (current liabilities) carried on this inside equity increased from $72,574 in 1926 to $103,733 in 1927, or 42%. The extra trading on the working capital equity was caused by the larger volume of transactions which lead to greater borrowing and purchasing on credit.

Since working capital is increased through only (1) the investment of capital through the flotation of capital liabilities or the conversion of capital assets, and (2) the investment of profits and reserves in current assets (or reducing current liabilities), the increase of the working capital fund bears only an indirect relationship to the volume of business. Hence, in order to check the investment in working and trading assets, it is more desirable to use the turnover of the total current assets than the working capital.

Insufficient Cash.—Another factor that should be watched in current reports is the amount of cash on hand and in banks.

A chronic condition of shortage in cash very often is an indication of insufficient working capital, and gives warning that the firm is in financial difficulty. This fact is often well known to management or those in control, and needs no special comment in the reports, although a note pointing out expected future difficulties if the condition is not remedied, might be included.

Just how much cash is sufficient for current business needs cannot be stated in particular cases. If the cash is unusually small in comparison with the other current assets; or if there are frequent overdrafts on the bank; if the records show a tendency to increasing notes payable and the shifting from accounts to notes payable; if the average number of days' purchases remaining unpaid is increasing; and if the purchase discounts lost is on the increase, then the conclusion may safely be drawn that the cash is insufficient for the volume of business which the firm is attempting to carry. This condition generally results from a shortage of working capital.

Over-Investment in Plant Values.—Excess plant investment means the tying up of large amounts of funds in fixed assets out of proportion to the volume of business done. This is noticeable among certain business concerns at the height of a period of prosperity when expansions are made in order to secure all possible trade. The productivity of the fixed assets may be found by comparing the net profit with fixed assets. The tendency to over-investment in fixed assets may be discovered by comparing sales with fixed assets less reserves.

Acme Furnace Company, December 31

	1924	1925	1926	1927
Real Estate	$ 78,135	$ 78,135	$ 79,360	$ 79,360
Building (net)	196,432	204,316	202,564	200,461
Equipment (net)	46,829	47,607	48,375	48,125
Furniture (net)	18,320	18,617	18,719	17,432
Transportation Plant (net)	8,519	9,118	9,250	8,160
Total Fixed Assets	$348,235	$357,793	$358,268	$353,538
Sales	$682,418	$677,480	$704,885	$873,040
Ratio of Sales to Plant	195.9%	189.3%	196.7%	246.9%

Figure 13. Ratio of Sales to Plant Values

The trend noted in the Acme Furnace Company (Figure 13) is favorable, as it registers a growing volume of business on a slight increase in plant investment, considering the fairly constant price level for wholesale goods during the years from 1924 to 1927.[2] Increases in the spread in prices over costs will tend to cover an enlarged investment in the plant and obscure the fact of a tendency to over-expansion in fixed assets. It has been suggested [3] that in case of sudden changes in prices, physical units instead of pecuniary units be used for checking trends in plant values.

Ratio of Fixed Assets to Total Assets.—A secondary check may be had on the investment in plant by a study of the ratio of fixed assets to total assets, and the ratio of fixed assets to current assets. The first ratio measures the growth of the plant compared with the total assets; the second ratio contrasts the tendency toward the investment in fixed as compared with current property. These ratio studies need no special emphasis outside of the fact that they supplement the report on sales volume and plant values. Rapidly expanding plant values should be checked, especially if they are not accompanied by a corresponding increase in the volume of business done. The ratio of fixed assets to total assets of the Acme Furnace Company (Figure 14) shows a slight tendency toward a lesser investment in the fixed asset department after 1924 due to the expansion of open accounts and merchandise on short term credit.

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[2] Close attention must be given to the general price level. Increasing prices tend to inflate sales values and leave plant values in the main unaffected, due to the fact that plant is held at cost less depreciation, while sales will approximate the general price tendency.

[3] See J. H. Bliss, Management Through Accounts.

The ratio of current assets to fixed assets reflects the same general situation and adds but little to the above ratio study.

Ratio of Non-Productive Assets to Total Assets.—A very useful report accompanying the percentage of fixed assets to total assets is a more detailed statement of the tendency to increased investment in non-productive assets. The accumulation of non-income yielding property places a strain on the resources of the business, as there is tendency to increasing overhead costs without a compensating return from the capital outlay. It also places a burden on the finance engineer who must provide the funds for such property units that often are devoid of profit, a fact that frequently makes the flotation of mortgage securities on such property a difficult problem.

In the case of competitive concerns, such investments take the form of outlay for "service," and while apparently necessary for creating goodwill, very often represent added costs that have been forced upon owners by conditions beyond their control.

In the case of privately owned public utilities, where the states and the federal government through the exercise of the police power require the expenditure of capital for non-productive purposes, the control problem resolves itself into a question of initiating policies that look to higher rates. The immediate control factor lies, first, in a reliable index of the investment in non-productive property, and second, in a changed price policy that will be adequate to cover the added current outlay for maintenance, depreciation, and interest.

Ratio of Sales to Total Assets.—A comparison of the annual volume of business done with the various groups of properties directly employed in creating sales volume, aids in controlling productive factors such as trade debtors, inventories, total current assets, and finally, the plant itself. All of the ratios of sales to these selling and producing factors tell one very important story, namely, that the investment in the

ACME FURNACE COMPANY

BALANCE SHEET, DECEMBER 31

	1924	1925	1926	1927
CURRENT ASSETS:				
Cash	$ 9,381	$ 8,432	$ 9,575	$ 12,560
Petty Cash	175	175	175	175
Notes Receivable	8,020	8,540	9,380	10,850
Accounts Receivable—Less Reserve	46,420	48,329	52,650	68,397
Accrued Interest	70	75	105	121
Inventories	94,308	100,106	101,754	111,048
Temporary Investments	10,000	10,000	8,500	11,300
Total Current Assets	168,374	175,657	182,139	214,451
FIXED ASSETS:				
Real Estate	78,135	78,135	79,360	79,360
Building (net)	196,432	204,316	202,564	200,461
Equipment (net)	46,829	47,607	48,375	48,125
Furniture (net)	18,320	18,617	18,719	17,432
Transportation Plant (net)	8,519	9,118	9,250	8,160
Total Fixed Assets	348,235	357,793	358,268	353,538
TOTAL ASSETS	$516,609	$533,450	$540,407	$567,989
CURRENT LIABILITIES:				
Notes Payable	16,432	17,375	16,430	15,475
Bank Loans	9,870	10,450	9,380	40,500
Accounts Payable	38,160	38,432	41,749	42,643
Accruals	3,960	4,960	5,015	5,115
Total Current Liabilities	68,422	71,217	72,574	103,733
FIXED LIABILITIES:				
Bonds Payable	150,000	160,000	175,000	175,000
TOTAL LIABILITIES	$218,422	$231,217	$247,574	$278,733
CAPITAL STOCK AND SURPLUS:				
Capital Stock	200,000	200,000	200,000	200,000
Surplus	98,187	102,233	92,833	89,256
Total Stock and Surplus	298,187	302,233	292,833	289,256
TOTAL LIABILITIES AND CAPITAL	$516,609	$533,450	$540,407	$567,989
Ratio of Owners' Investment to Total Liabilities and Capital, i.e., portion of business owned by proprietors	57.7%	56.6%	54.2%	50.9%
Ratio of Fixed Assets to Total Assets	67.4%	67.1%	66.3%	62.2%

Figure 14. Comparative Balance Sheet, Showing the Ratio of the Inside or Owners' Equity to the Total Equities; Also the Ratio of Fixed Assets to Total Assets

various items in the business has been kept in line with the growth in the volume of sales, or it has tended to get out of line through undue expansion, with the result that unnecessary amounts of capital have been employed for the work performed.

The sales ratio studies serve as an approach to the control over the proper distribution of capital investments within the business and furnish a guide for controlling the over-investment and over-specialization in particular departments, the ultimate effect of which is to strain the financial structure and eventually to cause insolvency.

A study of sales ratios should be made for the assets (sometimes called firm capital) as a whole. Such a report may be used for credit purposes or for internal management. It is a correlating report and serves as a check on the previous ratios of sales to receivables, sales to inventory, and sales to current assets, by indicating if the assets as a whole are tending to over-expansion when compared with the total yearly sales.

The ratios of sales to the total values invested in the business for the Acme Furnace Company for the years 1924 to 1927, inclusive, as given below, shows a conservative policy for all four years. The improved ratio for 1927 shows the effect of the larger volume done that year. The investment tendency in all departments has been kept within the sales volume.

Acme Furnace Company

	1924	1925	1926	1927
Sales Volume.............	$682,418	$677,480	$704,885	$873,040
Investment in Total Assets.	516,609	533,450	540,407	567,989
Ratio...................	132%	127%	130%	153%

The ratio of physical output to fixed assets (plant) and to total assets, in some cases, would be a better criterion of the tendency to over-expansion of plant or total investment in all assets. Physical output measured in units such as board-feet, tons, yards, etc., units that do not vary as a measuring device, can be compared directly with plant costs, which in turn is a fairly constant value factor. This physical output to plant ratio eliminates the change in price levels that is registered in the sales to plant ratio.

Ratio of Inside to Outside Equities.—The ratio of net worth to debts mentioned in Chapter III should be included as a part of the comparative report covering control over the solvency. This ratio is fundamental to an understanding of the part owned by the inside investors, the foundation upon which the business is built. The ratios of 57.7%, 56.6%, 54.2% and 50.9%, respectively, representing the per cent of the total business "owned" by the proprietors of the Acme Furnace Company, for the years 1924 to 1927, (Figure 14) show a decline, due not so much to a diminishing ownership, as to increasing liabilities created to carry the new working assets. The reduction in the ratio of fixed assets to total assets reflects the changed position in the relative amounts of current assets to fixed assets. The one checks the other.

An inadequate owner's investment is relatively more serious in the case of small concerns than with large ones. Where a concern has size and volume of business in its favor, it has access to the security market, especially for bonds, which is denied the smaller firm, largely because the latter is less known, its offerings are limited, and consequently it cannot appeal to the large underwriters who successfully sell the larger issues. For this reason the financial problem of the small concern is always serious. Reliable brokers capable of selling the average small issue are very limited in number; their charge is out of line with the cost of raising capital,[4] and in too many cases the broker is unable to complete the financing and leaves his client with a portion of the securities unsold, often with a plant partially paid for, and the balance covered with short-time loans.

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[4] The average cost of raising new capital in most states runs from 15% to 30% and higher. For going concerns the rates often run from 8% to 17½%.

Such securities are often sold below par to attract buyers, which in itself causes inflation of asset values and adds to the cost of procuring capital.

The average small corporation that starts with an insufficient capitalization, involves the greatest modern financial risk. Bankers cannot lend funds to them for capital purposes, and the small investor is ever becoming more wary. Often the only way of expanding in such cases is through the accumulation of surplus profits.

Ratio of Accounts Payable to Purchases.—For general internal statistical purposes and also for credit information, an important element of control exists in the use of the ratio that shows the proportion of the total purchases of the year that remains unpaid at date of the financial statements. It shows briefly how many days' purchases remained unliquidated, which might be called the age of the payables. It gives a clue, over a period of time, as to whether or not the firm is short of working capital and having difficulty in meeting its open accounts. The greater the number of days' purchases that remain outstanding, the older are the accounts payable and the lower is the debt-paying capacity of the firm.

A tendency to cumulative payables compared to purchases is a danger sign that usually calls for attention. This ratio of payables to purchases should be read in conjunction with the liquidity ratio, the turnover of receivables and inventories, to ascertain if the slowing down of the turnover of assets is not a contributing factor in causing the delay in payment of debts. The growth of accounts payables should also be compared with the tendency in notes and loans payable, to ascertain if there is a tendency to convert open accounts into notes.

The following statement shows a steady improvement in the debt paying:

	1924	1925	1926	1927
Purchases	$543,829.00	$643,517.00	$650,825.00	$690,212.00
Accounts Payable December 31	92,994.75	97,814.58	91,115.92	82,245.02
Ratio of Purchases Unpaid	17.1%	15.2%	14.0%	11.9%
Days' Purchases Unpaid	62.4	55.4	51.1	43.4
Net Terms in Days	40.0	45.0	40.0	40.0
Average Days Overdue	22.4	10.4	11.1	3.4

The per cent of purchases remaining unpaid has dropped from 17.1% to 11.9%. The days' purchases remaining in accounts payable dropped from 62.4 days to 43.4 days, and the average overdue accounts dropped from 22.4 days to 3.4 days. These figures are based on averages and hence not a complete report. In actual cases the results would be modified by seasonal purchases, and also by the possibility of early payments as indicated by purchase discounts taken. Over a period of time, if the volume of business remains approximately the same, an increase in the average age of payables is indicated, if they do not decline in amount proportionately with the increase in the actual discounts taken.[5]

Ratios of Earnings to Plant and to Total Assets.—While the amount and the rate of net earnings does not have a direct bearing on solvency conditions, nevertheless there does exist a critical relationship between profits (or losses) and the security of the investment. No business concern can long survive in the business world if subject to continued losses that drain the working capital. Losses from operations result in decreases of assets, generally current, or in the increase in current liabilities, or a combination of both. If continued over a series of years, operating deficits will inevitably lead to insolvency and bankruptcy.

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[5] See Chapter XII for a discussion of the relationship between discounts taken to potential discounts as a criterion of the average age of accounts.

Earnings that are less than the average for industries of a given type often result in a lessening of the credit granted to a firm, a condition in itself that will lead to curtailment of operations, the slowing down of the turnover rates, and possible ultimate failure. Earnings that fluctuate widely from year to year and from cycle to cycle, that show alternate periods of profits and of severe losses, indicate the existence of serious internal stresses and strains placed upon the business. Such earnings reports serve as a warning to credit departments, to the owners, and to prospective purchasers of securities, of the existence of extraordinary hazards that should be avoided.

Acme Furnace Company

	1924	1925	1926	1927
Total Capital Invested in Assets	$516,609	$533,450	$540,407	$567,989
Total Plant Values	348,235	357,793	358,268	353,538
Net Worth *	305,641	298,187	302,233	292,833
Net Profits	32,546	44,046	35,600	26,423
Dividends Paid	40,000	40,000	45,000	30,000
Rate of Profits to Total Capital	6.3%	8.3%	6.6%	4.7%
Rate of Profits to Plant Values	9.3	12.3	9.9	7.5
Rate of Profit to Net Worth at beginning of year	10.6	14.8	11.8	9.0

* Net worth at the beginning of the year. The net worth at the end of the year may likewise be used for comparative purposes. The former shows the rate of profit earned on the actual investment used during the entire year.

Figure 15. Ratio of Profits to Capital, Plant Values, and Net Worth

Therefore, it is desirable, in addition to the report covering the ratio of sales to fixed assets and sales to total assets, that a supplemental report be made covering the ratio of net profits to total capital employed, and profits to the net worth. In some instances a comparison of the net profit with plant values

is useful for showing the productivity of the plant itself, which often is the principal source of income. Such a report covering the Acme Furnace Company from 1924 to 1927, inclusive, is shown in Figure 15 on page 124.

The ratios show favorable trends for all years, excepting 1927, when the company made a low rate of earnings on the total capital. This unfavorable ratio was due to the sudden drop in the net earnings coupled with an increase in the total capital invested in the assets as a whole, which was occasioned by the increase of the current assets for trade extension purposes.

Ratio of Net Earnings to Total Earnings Reinvested in the Business.—The per cent of net profits left in the business and not paid out in dividends gives the final proof of the ultimate growth of the business. Profits that are "plowed back" into the business result in either the reduction of liabilities or the growth of assets, which normally require financing through the flotation of capital stock or the creation of liabilities. When profits are used for the permanent liquidation of debts, a protection is given in a better solvency position.

The Acme Furnace Company (Figure 15) shows a rather heavy payment of dividends and a correspondingly small amount of profits reinvested in the business. In three years out of the four, more profits were removed in the form of dividends than were earned during this period. In 1924 the excess of dividends paid out over earnings was $7,454, in 1926 the excess was $9,400, and in 1927 $3,577. In 1925 the net profits reinvested amounted to $4,046. In the four years the excess dividends over profits withdrawn from the business amounted to $16,385.

Ratio of Profits to Stock Outstanding.—The rate of profits earned each year to the par value of outstanding stock or the amount of profits earned on each share of non-par stock, is of vital importance to security values. If there be no preferred stock ahead of common, the entire amount of net gain is compared directly against the common stock outstanding. Where preferred stock exists, the amount of the preferred dividends is deducted from the net profits, and the remaining profits applied to the common stock. In the case of the Acme Furnace Company the following rates were earned on the common stock:

	1924	1925	1926	1927
Common Outstanding	$200,000	$200,000	$200,000	$200,000
Net Profits Earned	32,546	44,046	35,600	26,423
Rate of Profit on Stock	16.2%	22.0%	17.8%	13.2%

If instead of being all common, the issue had been divided $100,000 of 7% preferred and $100,000 common stock, the computation of the rate of earnings on common would have been as follows:

	1924	1925	1926	1927
Preferred Stock	$100,000	$100,000	$100,000	$100,000
Common Stock	100,000	100,000	100,000	100,000
Earnings	32,546	44,046	35,600	26,423
Dividends on Preferred 7%	7,000	7,000	7,000	7,000
Rate on Common	25.5%	37.0%	28.6%	19.4%

CHAPTER VIII

ACCOUNTING STANDARDS—VALUATION

In Chapter II it was stated that three types of standards are required to measure business facts. Financial standards were discussed in connection with balance sheet ratios, and operating standards in connection with processing and merchandising ratios. Accounting standards have been brought into the discussion from time to time in connection with these standards for the sake of clearness in exposition.

The present chapter concerns itself with a brief outline of accepted accounting norms or standards that are currently used by many practicing accountants for the classification and valuation of balance sheet items. The objects of accounting standards at all times are definitive; in short, to secure accurate, reliable data, consistent as to content, one period compared with another. One of the most serious criticisms of present-day accounting reports is vagueness as to the meaning of the accounts included in the statements. Nomenclature has as yet not been standardized and accepted by the profession. Another criticism is the lack of consistency in the comparative reports, due to the fact that no adequate control exists over content, a condition that causes variations in the accounts due to ordinary errors in omission and commission. In one report, for example, an item may be classified as a current asset, and in a second report the same recurring item may be classified as a fixed asset. Such accounting practice is inconsistent with sound business practice.

Assets

Current Assets.—In current assets should be included only those assets that may be readily converted into cash, as it is from this group of assets that funds must be obtained with which to meet the current liabilities. The nature of the business and the trade customs prevailing in the locality will determine the maturity of the current liabilities, the period being from 60 to 90 days. Since the function of the current assets is to meet these liabilities maturing in 60 to 90 days, nothing should be included in the current asset group unless it can be converted into cash within this period. The current obligations owing by the firm must be paid in cash, and the liquid assets must supply this cash. Among the items commonly included in current assets are cash, notes receivable, trade acceptances, accounts receivable, inventories, and accrued items owed to the business.

Cash on deposit with banks, and cash on hand available for meeting maturing obligations, subject to no withdrawal restrictions, constitute the current cash. Only cash without legal restrictions as to its use should be included. Cash funds that are subject to a legal limitation, such as being on deposit and liable to return to others, or held in trust to meet sinking fund requirements for bond redemption, should not be listed in the current cash account. Cash due from employees, loans to officers, advances to salesmen, due bills, n. s. f. checks, IOU's, and similar non-cash items, should not be counted as cash but are properly classified as "other receivables," or are written off if not collectible. Cash in foreign banks should be reduced to domestic currency by conversion at the market rate of exchange and shown separately in the balance sheet. Time deposits are usually shown separate from cash in bank and cash on hand. Overdrafts are current liabilities; overdrafts on one bank should not be cancelled against accounts in other banks.

Notes receivable differ from open accounts receivable in that both the amount and date of maturity of the notes have been approved by the makers, and moreover, since the notes are negotiable in form, they are usually more readily convertible into cash by discount with the bank than are the book accounts. Only those notes which mature within the current period should be included. Any notes which have been pledged for special purposes, or which have been discounted or sold to the bank by endorsement, should be eliminated, or shown deducted from the notes, since the business has already received their equivalent in cash. Notes which have not been taken in the regular course of business, such as those given by officers, or for the payment of capital stock or ownership in the business, should be shown separately. Protested notes have no place in this group in the balance sheet, but should be specially featured in another section or charged to profit and loss.

All foreign and domestic exchange items that have been accepted should be listed as notes or bills receivable and shown separately. Prior to acceptance they are open accounts. If drawn on merchants and dated at the close of a net credit period, they represent an extension of credit and are of less value than if drawn at date of sale.

Trade acceptances in proper legal form rank as a special type of notes. Under the rediscount provisions of the Federal Reserve Act, they constitute a ready source of funds, and in fact may be considered one of the best sources of current cash.

Accounts receivable and *trade debtors* are used interchangeably as titles for accounts due to the business firm, created by the sale of merchandise. Items due from other than regular customers, such as amounts due from employees, officers, etc., should be shown under another heading called "Accounts Receivable Special." Amounts due from subsidiary or branch offices should be indicated as "Amounts Due from Subsidiaries." This clear-cut distinction of the nature of the receivable is required to secure a measure of the rate of turnover, also a measure of bad debts, and a more adequate control over trade credits and collections.

For a "credit" balance sheet the accounts receivable should be grouped in such a way as to show those amounts that are not due and those that are overdue; or those accounts which are less than 30 days old, those less than 60 days old, those less than 90 days old, and those over 90 days old.

Both notes and accounts receivable held in foreign countries, as well as cash held abroad, should be reduced to domestic currency by conversion at the current market rate of exchange.

Inventories of (1) raw materials, (2) goods in process, and (3) finished goods, although a step farther removed from cash than are notes and accounts receivable are classified under current assets. The accounting standard for the valuation of all materials bought for resale or for fabrication is cost or market, whichever is the lower. If the market price rises and goods are appreciated accordingly, the inflation will result in an unearned profit; a violation of an accounting norm which states that no profit is ever realized until goods have been sold. Since it is not known at what price the goods will be sold, conservatism would dictate that the lowest price be used. In liquidation the market price under assumed forced sale conditions governs the valuation of inventories. If the price has risen since the date of purchase, a footnote in the reports usually is sufficient for most purposes.

Goods in process while carried at book costs for a going concern should be reduced to practically scrap value if liquidation is contemplated, because of the extremely limited market for partly finished goods that must be completed generally away from the plant, and at added costs over the factory expenses.

Goods that have been fabricated, i.e., finished goods, are carried at cost of manufacturing unless the market has declined, in which case, the market price should govern.

Finished goods out on consignment plus any transportation costs allotable thereto, should be included at cost or market, whichever is lower. Goods held by the firm on a consigned basis should not be included in the inventory for the reason that title vests with the consignor. To include such goods as inventory would result in the increasing of the inventory and of profits by the amount of the goods thus included.

Shop-worn and out-of-date goods should be valued at replacement costs, a figure usually below cost. Goods under special collateral pledge to bankers or creditors should be specially noted in the balance sheet.

Accrued items, such as interest income, rent income, commissions earned, payment for services rendered, and similar items, if they have an early maturity, are also assets, and in some instances may be included in the current asset group, although more often these items are included in a separate category.

Deferred Charges.—This group should include all prepaid expenses, such as insurance, rents, commissions, and other operating costs, that have been paid in advance but from which the full benefit has not yet been received. These items will not be sold and seldom are converted into cash in a going concern. Moreover, their value is largely dependent on the existence of the business as a going concern, since in liquidation they have only a small forced sale value. The correct method of determining their value is to ascertain the initial cost and then divide this sum into two parts: (1) the portion used, which should be carried to the profit and loss statement; and (2) the part remaining (unused) which should appear in the balance sheet as a deferred charge. These latter items should not be listed as current assets, since they are not ordinarily converted into cash. In one respect they are current assets, as they represent an amount of cash expended for operations during the next fiscal period. They are usually reduced to a sub-schedule in balance sheet reports.

Investments.—Securities and investment of sinking funds and other reserved funds, if not readily salable without impairing the business, should not be classified as current assets. The investor's chief concern in items of this type, is whether the securities are free from all restrictions, such as use for the redemption of bonds, for special replacements, etc., and are readily marketable. If they have been purchased for secondary reserve purposes, i.e., as a temporary device for the employment of idle cash, the securities may be considered temporary investments and classified as current assets. But if they have been purchased for the purpose of securing adequate and profitable business connections, and if their sale would result in a loss of income or of security in the business community, then such items should be classified as permanent investments. Or if the funds or securities have been pledged for other than operating purposes, and the title and possession passed, to let us say a trustee, again the item is, strictly speaking, a permanent investment.

Fixed Assets.—All property which has been procured for use in the production of goods, or the rendering of services, not for the purpose of resale in the course of business, is properly classified as fixed assets. In controlling the valuation of all fixed assets for balance sheet purposes, neither the market value, the replacement value, nor the capitalized income value should have any consideration. Likewise, no market fluctuation should be reflected in the balance sheet unless possibly as a footnote.

For all physical assets, excepting real estate, the rule for valuation is cost price less depreciation. In case the item were bought for cash, the bona fide cash outlay is the measure of value. If the property has been bought with stocks or bonds or mortgages, a fair market value of these securities is the measure of value of the property. Discount on stock used for purchasing assets should be deducted from the value of the property. Discount on securities is not property, but discount, and it should be labeled as such. Discount on bonds is a deferred charge written off to profit and loss over the life of the bonds. This cost should not be capitalized by adding it to the

property account. The measure of stock and bond discount may be ascertained only if a general market exists for these securities. Equipment purchased or manufactured at a cost below market should be carried at the lower figure, and not written up to market value. The latter practice creates a fictitious profit, one not earned, as true profits are made only from a sale. The raising of the value results in increasing the depreciation charge. If the so-called profit results in a greater disbursement of dividends, the net effect is the depletion of working capital. If an appraisal results in writing up the value of property owned, the increment of so-called gain should be earmarked as a special reserve and not included as a part of surplus.

Undercharges for depreciation [1] and a less than normal depreciation reserve, result in an overvaluation of assets; overcharges for depreciation and overstated reserves for depreciation, result in an undervaluation of the assets.

Conditional Ownership of Property.—In case the firm has conditional ownership of any asset, for instance, where the title to the plant site, right-of-ways, leases, etc., is to pass to the firm only upon the happening of certain events, it may be claimed that the value alone of the improvements that can be removed, is property. If the agreed upon conditions are not fulfilled, and title is not vested in the firm, a balance sheet showing such items as fee simple property is a misrepresentation of facts. All property whose value will expire before it would normally be replaced, should be written down and charged to profit and loss ratably as the value expires.

Fixed assets should represent properties that are useful for producing or facilitating the production of income. Obsolete equipment, abandoned rights of way and easements, expired patents and copyrights, and other useless items, should not be included. They afford no security to creditors or income to the owners.

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[1] For a more complete discussion of depreciation and depreciation reserves, see Chapters X and XI.

Intangible Assets.—All property of an intangible nature should be properly identified in a separate section of the balance sheet. By the nature of the case, such items as goodwill, patent rights, franchises, royalty contracts, leases, etc., have no known ascertainable value, except when bought for cash. Much of the odium attached to intangibles is due to the fact that their value has simply formed the basis of stock capitalization, rewards of which went to the promoter. If the intangible has real merit as an income producer, its productivity in terms of excess income over the return on the plant, may be capitalized at the going rate of return for industries of a like type, and a value given to it. Thus if the excess return attributable to goodwill amounted to $10,000, and if the extra income was considered perpetual, the value of the goodwill, money being worth 10%, would be

$$\frac{10{,}000}{.10} = \$100{,}000.$$

Unadjusted Debits.—Balance sheet debit items that are indeterminate in value or that are in "suspense," awaiting a future classification, are called "unadjusted debits." These items may be assets or deferred losses. Examples are: suspended fire losses, organization expenses, discount on stock, bonus given with the sale of securities, etc. For valuation purposes the only question is whether the item has a going concern value. If not, it should be charged against the surplus, over a period of years.

Liabilities

Current Liabilities.—Accounting standards for the valuation of liabilities are well known to the accounting profession and broadly accepted wherever sound accounting is employed. Only the briefest outline can be given here. For the sake of consistent reporting, the debts are listed into three groups corresponding to their tenure and the purpose for which they were created.

The short-term debts of the usual trade type, running 30, 60, 90 days, are listed as current, corresponding to the current liquid assets, with which they are contrasted in balance sheet reports. They represent the quick debts that must be met within the brief period of commercial credit extension, out of cash received from the turnover of current assets. Fixed liabilities represent the long-term securities usually running beyond one fiscal period, used for capital financing and usually refunded or redeemed out of sinking funds.

The outstanding problem in valuation is the avoidance of understating the current liabilities. Omission of such debts usually results in an overstatement of profits and gives a false liquidity position. Secured creditors should be shown separately as should properties under pledge, since special liens lessen the equity of the general creditors.

Notes payable may be classified as to, (1) notes arising from commercial transactions, and (2) borrowing from bankers. A third class may be made of notes given to officers, employees, and others. The latter is a sign of credit weakness, as the loans may be on a personal and not a business basis. The listing of all notes according to their age gives a good indication of the promptness in meeting bills.

Trade acceptances are ranked as notes after date of acceptance and are of slightly higher standing than most notes, because of the fact that they are usually sent to the bank for collection.

Accounts payable should include only those obligations incurred in the course of commercial transactions. They consist of the open book accounts representing obligations for goods bought for resale or for productive purposes. "Trade creditors" is a synonymous term for accounts payable. Miscellaneous book accounts representing debts to other than trade creditors should be shown separately under the heading of "Accounts Payable Special." The "aging" of all open accounts assists in approximating the promptness in paying these accounts. The average age of payables can be detected by the same measuring device as was used for receivables.

The *normal* amount of accounts payables can be ascertained in the same way as the *normal* receivables. If the wholesale credit terms are net 45 days, or eight credit terms per year, the normal payables should be one-eighth of the purchases for the year, on the further assumption that no discounts are taken and purchases are made ratably throughout the year. Naturally a serious difficulty encountered in the use of averages is the fact of possible seasonal purchases that result in large payables at one season and small payables at other seasons.

Accrued Expenses.—This group of items that normally are current, consist of amounts due for current unpaid operating expenses, such as salaries, wages, taxes, interest, etc.—items that are liabilities but which have not matured into current debts at the date of the report. The expenses which gave rise to these liabilities are chargeable to the current period; the accrued liabilities carry over and are paid in the next period. Accruals are sometimes listed under the heading of "operating" reserves. The title "accrued liabilities" indicates more nearly their true status as debts. Being relatively unimportant as details, accrued items are generally reduced to a schedule, and listed in the balance sheet as a current debt.

Unearned Income.—Income which has been recorded as revenue and which has not fully matured at the date of closing, is listed as a liability. The subscriptions, for example, to a publication paid in advance is a liability for future service to be rendered. Other items in this class, unearned rents, commissions, interest, etc., are income. The problem of valuation is that of properly dividing such revenue into the earned and

the unearned portion. The latter appears as a liability in the balance sheet statement.

Dividends Payable.—If properly declared by the directors and recorded in the corporate records, dividends are considered current debts. They can be sued upon as any other matured debt of a corporation. Accrued dividends on cumulative preferred stock are not liabilities, and generally do not appear in balance sheet reports. Interim dividends are paid during the year, prior to the annual closing. The bookkeeping entries are the same for this latter type as for the former, when declared and set aside as a debt to stockholders.[2]

Money due to consignors for goods sold is properly classed as a current liability. Such items are sometimes erroneously called "consignment sales" and placed in the profit and loss statement, a practice that results in wrongly labeling a liability as an income item.

Fixed Liabilities.—Debts of a relatively remote maturity generally extending beyond the current fiscal period, are classified as fixed liabilities. Bonds payable issued on the security of property or collateral is the principal type of fixed or funded debt. The balance sheet title should appropriately describe the lien as: "First Mortgage 6½% 45-Year Bonds," or "20-Year 7% Gold Notes of 1925." Bonds are outside equities and should not be classified in the ownership or net worth section. Bonds, or any other type of liability, should not be cancelled against the pledged property used as security.

All property and all liabilities should be fully extended in order to show full amount of debts; not the net equity or balance owned in property after deducting debts. Corporation bonds that are divisible into small units and which are issued through a deed of trust, should not be confused with real estate bonds and mortgages which cannot be divided. They are issued direct to the holder without the intermediary of a trustee.[3]

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[2] The bookkeeping entry for the declaration of a dividend is as follows:
Dr. Surplus or Undivided Profits
Cr. Dividends Payable
When the dividends are paid in cash, this entry:
Dr. Dividends Payable
Cr. Cash
The payment of a stock dividend gives rise to this journal entry:
Dr. Surplus or Undivided Profits
Cr. Stock Account

Contingent Liabilities.—Debts which are not formally recorded but which may be pressed for settlement against a concern because of its indorsement or guaranty, are contingent liabilities, and in all cases of sound accounting practice, should be recorded in the balance sheet. Some of the more important contingent debts are: indorsements on notes or drafts discounted, accommodation indorsements, leases transferred by indorsement, guaranteed bonds and preferred stock and the earnings thereon, and liabilities under pending or appealed lawsuits.

In most cases the secondary liability of the contingency is more absolute than is the corresponding contingent asset because the liability may turn into a primary obligation. The contingent asset seldom can be realized for an amount sufficient to pay the resulting primary liability. The contingent happening fixes the debt, which leaves the new obligor with only a right of action against the defaulter. Where there are no previous indorsers this asset is of doubtful value. Therefore, all contingent liabilities should be reported in financial statements.

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[3] The bookkeeping entries for the issuing of bonds or mortgages is as follows:

Dr. Cash or Property
    Cr. First Mortgage 6½% 45-Year Bonds
        or
Dr. Bonds Authorized
    Cr. Bonds Payable
Dr. Cash
    Cr. Bonds Authorized

Proprietorship.—The net worth of a single proprietorship or a partnership is indicated by the capital accounts of the owners. As no separate account is kept with profits earned, the surplus gains are merged with the capital accounts. In a corporation the proprietorship is represented by three items: (1) capital stock, common and preferred, outstanding; (2) the accumulated surplus representing net gains not closed into capital stock accounts; and (3) surplus reservations representing amounts set aside for specific corporate purposes. Capital stock of par denomination should be shown at par value, any discount or premium being shown separately. Treasury stock, donated back to the corporation, or repurchased, should be deducted from capital stock and should not be shown as an asset. Non-par common or preferred stock is shown at the figure received for the stock. Issues of non-par stock at different prices are not separated but shown as a unit. For example, 1,000 shares of non-par stock sold at 60 would be shown in the balance sheet—

"Non-Par Common" (1,000 shares)	$60,000

If a second issue of 1,000 shares were sold at 75, the balance sheet after the second sale would be—

"Non-Par Common" (2,000 shares)	$135,000

Treasury non-par stock, if purchased for resale, should be carried at the purchase price; donated non-par stock at a nominal figure or at the last sale price. Surplus should represent only profits earned from operations.

CHAPTER IX

PROTECTION OF THE INVESTMENT—SURPLUS

The Function of Surplus.—An operating surplus earned and reinvested in the property of the concern, affords a security to the investment as a "shock absorber" in the sense that adverse operating conditions can be successfully met, if surplus funds are available for such emergencies. The surplus usually is depleted before the original capital fund is encroached upon, and to the extent that it aids in staying a condition of insolvency and bankruptcy, the surplus protects the investor. The larger the surplus, the greater its sustaining power, and the greater its protection.

In the last analysis the history of a surplus is the final record of the profit-making potentialities of a business. It reflects the degree of success attendant upon the policies of management in meeting its purely merchandising problems. The surplus aids in establishing the fact of successful management as such, a condition highly desirable in establishing credit standing, trade connections, and trade prestige, which are themselves strong elements of protection. One of the most important factors in establishing banking credit and a market for corporate securities is a history of successful operations, measured by the accumulation of a sizable operating surplus.

Appropriated Surplus.—Surplus that is undifferentiated as to its origin, i.e., earned from operations, donations, paid-in capital, etc., and unidentified as to its present function in the business, fails in a large measure to show in a comprehensive

way, the manner in which the surplus is aiding specifically in protecting the investment. That portion of the surplus which has been set aside for the permanent upbuilding of the corporate estate, that is, appropriated for the benefit of the corporation itself through a formal declaration of the directors, and earmarked as such in the balance sheet, indicates strength in three ways:

1. The financing of fixed assets or working capital or both, with an equity belonging to the corporation itself—an equity which has no restrictions, no maturity, no carrying costs or foreclosure possibilities. In short, it is the ideal financing method for expansion purposes.
2. It brings freedom and independence from creditors through the provision of funds for trade expansion, without unduly drawing on bank credit offerings, so well illustrated by the Ford Motor Company's use of its large corporate surplus for banking purposes.
3. It relieves a portion of the surplus from its possible dividend liability and gives the corresponding protection to the working capital.

However, a full report covering the protection afforded by the appropriated surplus is not complete with the statement of the amount of profits set aside for the benefit of the company. Three additional facts must be ascertained: (1) the identity of the surplus among the added assets or the reduced liabilities; (2) the use made of these added assets, whether fixed property, intangibles, or current; and (3) the earning capacity of the newly acquired assets.

The identification of the appropriated surplus, which is merged with the problem of the identity of other profit and sundry reserve reinvestments, can be accomplished by the use of comparative balance sheets, for illustrations of which the reader is directed to Chapters IV and V. In case it is ascertained that the full amount of the surplus has found lodgment in the working assets department and has been kept in a liquid condition, a full measure of protection is afforded. But if a portion of it has become frozen through slow turnovers of merchandise or of receivables, or has become invested in non-productive assets, the appropriated surplus loses its potency as a factor in strengthening the corporate financial structure. A good illustration is the case of the railroad that spent its surplus funds and reserve money in branch lines that failed to make an income and later were subsidized from company funds. Such a surplus could well be termed a "liability," as revealed through the necessity of scrapping obsolete property.

Property that ceases to be productive and fails to make profits is a poor "representative" of the surplus. In most cases the possession of a surplus is assumed to give unusual strength to the firm. Thus it must be noted that a finer discrimination must be made in these balance sheet surplus items in order to determine their true value for purposes of control and protection. Surplus appropriations ordinarily connote strength and imply successful past history, but not in every case.

Protection Afforded by Reservation of Profits Pledged to Retire Funded Debts.—One of the major financial difficulties of business concerns, especially of the larger types, is the possible necessity of being obliged to refund its bond issue or mortgage indebtedness in a business depression. Bond maturities cannot be planned with any degree of certainty with regard to the condition of the general money market at the date of redemption. There can be no assurance that the general demand for funds at the date of redemption will be small, due to the fact that too many maturities may have been crowded into a nominal money market, by the lack of planning on the part of those companies that do long-time financing. The result is that an added strain may be placed upon the money market by an attempt to float too many refunding or refinancing issues in a single year, or at a time of stringency. Bankruptcy often results from such conditions. Serious financial embarrassment is faced by practically all concerns that have future refinancing problems.

In order to avoid such a contingency and to provide 100% protection, a firm may be enabled to figuratively "hurdle" a panic or even a depression by accumulating sufficient funds to completely pay off the debt. Cash is set aside annually and paid into the hands of a trustee whose responsibility it is to see that the correct amount is invested in securities suitable for sinking fund purposes. In most instances all of the conditions for the operation of the fund and the responsibilities of the trustee are carefully outlined in the deed of trust executed at the time the bonds are issued.

However, absolute safety does not result from the creation of a sinking fund. It indicates only that funds may be available to redeem the bonds at due date. But there is nothing to hinder the paying of dividends at the same time to stockholders, thus resulting in a double drain on the current working funds, first for sinking fund purposes and secondly as profit payments. In so far as the accounting records act as a regulator in the matter of cash payments, only partial control is exercised by the use of sinking funds when unaccompanied by other control devices that restrict the payment of dividends, while cash is being accumulated for redemption purposes. Only partial protection of the investment is afforded the stockholders and the general creditors.

Sinking Fund Reserves.—By setting aside an amount of profits from the surplus each year equal to the cash placed in the sinking fund, and by earmarking such profits in a special reserve called Sinking Fund Reserve, an effectual device is used to stop the payment of a part of, if not all dividends. In effect, this procedure is tantamount to a temporary segregation of the surplus into two component parts: first, "operating" surplus, and "reserved" surplus, the latter amount covering the sinking fund reservation.

To the extent that the operating surplus is the measure of the dividend paying capacity of a concern, the diminution of this surplus, by taking a portion of the yearly profit and placing it in the reserve, indicates a lessened capacity for paying cash dividends to stockholders. Hence, through the balance sheet notice is given to all interested parties that for a period of time extending to the maturity of the bond indebtedness, a part of the surplus will be set aside for the specific purpose of withholding dividend payments in an amount equivalent to the payment into the sinking fund.

To the extent that this reservation of surplus in a special reserve tends to limit the payment of dividends on the part of the trustees who are guided by the corporate statements, and to the extent that the showing of a smaller surplus to stockholders tends to limit the demands of the latter for high dividend rates, this special accounting device, known as a covered reserve, functions as a control factor. In the last analysis the sinking fund reserve directs the payment of cash into the hands of the sinking fund trustee and away from stockholders.

Where this procedure is dictated by the lender in the deed of trust, the board of directors have no choice in the matter, but to "pay into the sinking fund out of profits" annually an amount which will accumulate with interest to the principal of the bond issue or mortgage at the date of maturity. In this case the accounting records show that the covenant with the bondholders has been fulfilled. Such a practice affords well-nigh perfect protection in paying off funded debts.

A question might be raised whether or not the borrowing concern has been fully benefited by the requirement that takes from the business, cash that may be making a higher rate of earning than is afforded in the limited type of securities which are eligible for sinking funds. In part the answer is made in the choice of protection as against added earning power. However, sight must not be lost of the fact that profit-making is a function of security, and the capacity to pay bond interest is involved in earnings. The sinking fund reserve does not weaken the financial structure of a concern, and on the whole gives an added element of strength in the same way that surplus is a protection to the investment.

Sinking Fund Reserves Without Sinking Funds.—If a borrowing corporation is not required by contract to set aside cash in a sinking fund, or if it is able to earn a distinctly higher rate of profit on its cash than a nominal rate of interest, by employing the money in the business for operations, the sinking fund may be omitted. In this case the only protection given would be a sinking fund reserve. This procedure tends to diminish the payment of dividends in the way mentioned above, namely, through a special reservation of the surplus and a lessening of the amount of profits available for dividends.

Such a plan of financial engineering has some disadvantages. No specific fund will be available for bond redemption at maturity. If increased volume of credit be extended to customers, or if larger inventories be carried as a result of an investment of the funds in the operating department, it means that the money for redeeming the bonds must be secured from a contraction of credit, from more rigid collections, or from a reduction of the inventory and other current assets in which the money is invested, at the date of the bond redemption. If these methods are unproductive of results, difficulty will be met in raising the necessary funds.

Obviously, if the cash has been invested in plant or any type of frozen assets, a more serious problem will arise. In a similar way trouble will come if the sinking fund reserve has been "invested" in any of the debts of the concern, except the bond issue, which is the object of redemption.

While a degree of protection is given the investor or owner in the sinking fund reserve, the plan of using it without the fund, in many cases, puts the financial engineer to the necessity of raising cash from outside sources if the profits have been reinvested indiscriminately in the business. Avoidance of this risk, however, is the ultimate purpose of sinking fund financing, and it is here that the only important weakness of "uncovered" reserves is featured.

If the company's own bonds are redeemed currently with cash, such a practice in effect amounts to the use of a sinking fund, a method often followed where serial redemption is involved. This redemption plan has advantages, especially where bonds may be purchased at a saving in the open market. The interest "earned" is the saving in interest cost on the bonds thus purchased.

Final Disposition of the Sinking Fund Reserve.—After the sinking fund reserve has served its purpose during the life of the bonds and no longer is needed to indicate the segregation of profits, it is usually turned back in its entirety into the surplus whence it came originally. The profits which have been accumulated over a period of years are shown as "profits" for the first time, upon the redemption of the bonds. The Surplus account is thus increased by an amount equal to the bond issue. Obviously no profits have been made by this accounting entry, as it simply merges the surplus items into one account.

The surplus is now free for any legitimate corporate purpose, and dividends can be paid as if no reserve had been created out of profits in the first place. If there is an insufficient amount of net free cash available for paying dividends, due to the fact that the sinking fund may have absorbed all ready cash, borrowing may be resorted to for dividend purposes. Safety in borrowing for dividends would depend upon the ability of the company to repay the loan in a relatively short time. In some cases short-time bonds may be issued, or bank loans may be used for dividend purposes.

In case a loan is not used for cash dividends, a stock dividend may be issued in its stead. This plan obviates the risk of borrowing, and as a policy in protecting the investment, the plan is highly desirable. It satisfies the stockholders' demand for remuneration, and, more important, conserves the working funds and improves the debt-paying capacity of the business.[1]

A question might be raised as to the potency of the newly increased surplus, as merged from the sinking fund reserve, in protecting the investment after the debt has been cancelled. In answer to the inquiry, "Where is the surplus?" the immediate identification is found in the absence of the debt itself. A reduction in liabilities, with no change in other liabilities or in assets, has resulted from an increase in net worth. The increased profits over a period of years placed in the sinking fund reserve has now found expression in the elimination of the bond issue or mortgage debt, through the conversion of the sinking fund and the redemption of the outstanding bonds. During the life of the bonds the reserve checked profit payments and thus in part guaranteed redemp-

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[1]

BALANCE SHEET BEFORE BOND REDEMPTION

Plant	$ 8,000,000	Stock	$ 5,000,000
Current Assets	1,000,000	Bonds	3,000,000
Sinking Fund	3,000,000	Surplus	1,000,000
		Sinking Fund Reserve	3,000,000
	$12,000,000		$12,000,000

BALANCE SHEET AFTER BOND REDEMPTION

Plant	$ 8,000,000	Stock	$ 5,000,000
Current Assets	1,000,000	Surplus	4,000,000
	$ 9,000,000		$ 9,000,000

BALANCE SHEET SHOWING CREATION OF A CURRENT LOAN AND THE PAYMENT OF A $500,000 CASH DIVIDEND

Plant	$ 8,000,000	Stock	$ 5,000,000
Current Assets	1,000,000	Current Liabilities	500,000
		Surplus	3,500,000
	$ 9,000,000		$ 9,000,000

BALANCE SHEET SHOWING EFFECT OF A $3,000,000 STOCK DIVIDEND

Plant	$ 8,000,000	Stock	$ 8,000,000
Current Assets	1,000,000	Surplus	1,000,000
	$ 9,000,000		$ 9,000,000

tion; after the amortization of the debt, the reserve (now surplus) registers the accomplished fact of the debt payment.

Substitution of a Sinking Fund Reserve for a Depreciation Reserve.—Can a sinking fund charged to operations be used for the dual purpose of providing for a sinking fund reserve for debt amortization and at the same time be used as a charge for depreciation? It has been argued that since the sinking fund charge is not an expense of the business incurred for operating purposes, but a charge against surplus made for the protection of the bondholder and the issuing firm, the sinking fund reserve can in effect, upon the date of bond redemption, be renamed and called a Depreciation Reserve, if the rate of accumulation is the same as the depreciation rate.

In short, the question raised is one of whether or not the depreciation charge and the sinking fund charge are not double charges, and whether or not the two reserves do not afford double protection, one to the bondholder and the other to the owner who is interested in reserving profits for replacing the plant when worn out.

To answer the question fully, a further analysis must be made concerning the nature of the different charges. Depreciation is considered an expense of operations and as such is listed as a cost item in determining net profits. The sinking fund charge is taken from surplus after net profits have been determined. It is not treated as a cost, except perhaps where a public utility is purchasing the plant out of profits and charging such purchase price currently to the public as a part of the price of the final product. If depreciation is a recognized expense and its inclusion is necessary for the correct determination of net profits, and if the trust agreement provides that the sinking fund shall be set aside "out of profits," the omission of the depreciation charge amounts to a technical violation of the trust agreement. Depreciation must be included as an expense to determine net profits; the sinking fund charge is made after depreciation. Failure to include depreciation causes an inflation of profits.

If the depreciation charge is omitted under such circumstances and the sinking fund charge is made as an expense item and charged to profit and loss, the resulting reserve, while named a sinking fund reserve, is in reality not an earmarked portion of proprietorship, but a pure valuation reserve. Such an arrangement fails to act as a deterrent to dividend payments. The sinking fund would not be "set aside out of profits" in the meaning commonly understood where the practice is used with this object in view.

However, where the trust agreement designates a sinking fund without the reserve, the problem is one of financial and accounting convenience. Here the one charge, if made to profit and loss, is sufficient to cover the depreciation costs, whatever be the label attached to the reserve. In the last analysis such a reserve strictly speaking is a valuation reserve, and does not carry the function of the typical proprietorship reserve. A sinking fund would be accumulated in due time. The redemption of bonds as usual would be made out of the funds accumulated and measured by the sinking fund and the so-called sinking fund reserve, the latter, in fact, being a mere valuation reserve. The bonds would be paid out of the values accumulated to replace the assets against which the bonds were originally issued and for which the depreciation reserve is ordinarily created.

Accounting Procedure for Sinking Funds and Sinking Fund Reserves.—For account classification purposes, sinking funds are not to be rated as a part of either the current or liquid assets in making up financial reports. Since such funds are under the custody of a trustee and beyond the control of the treasury department, such moneys are not available for the use of the company for paying any but the funded debts for which the money has been pledged. The item should be shown under a separate heading that designates the true character of the fund, such as, for example, "Sinking Funds and Investment of Special Reserves." Under this heading may also be put insurance, bonus, pension, and like funds. The sinking fund reserve should be shown as a portion of the net worth, as a segregation of surplus.[2]

Reserves for Contingencies.—A considerable degree of protection is to be found in the existence of contingent reserves.

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[2] If the agreement called for sinking fund payments made out of profits, the accompanying entries would be made:

(1) Dr. Surplus
Cr. Sinking Fund Reserve

At the appointed time when the money is remitted to the trustee the following entry is made:

(2) Dr. Sinking Fund Trustee
Cr. X Bank or Cash

When the trustee reports on the investment of the cash in securities, the following entry:

(3) Dr. Sinking Fund Securities
Cr. Sinking Fund Trustee

Explanations showing the type and amount of various securities purchased by trustee should be made with the entries.

At the date of the redemption of the bonds this entry:

(4) Dr. Cash
Cr. Sinking Fund Securities
(5) Dr. Bonds Payable
Cr. Cash
With explanation showing the sale of the sinking fund securities and the redemption of the outstanding bond issue.

The sinking fund reserve is then cleared into surplus with the following entry:

(6) Dr. Sinking Fund Reserve
Cr. Surplus

If a loan be made to pay cash dividends at this time:

(7) Dr. Surplus
Cr. Dividends Payable
With adequate explanation.
(8) Dr. X Bank (cash)
Cr. Loans Payable
With explanation showing type of loan for paying dividends.
(9) Dr. Dividends Payable
Cr. X Bank (cash)

If a stock dividend is paid instead of a cash dividend:

(10) Dr. Surplus
Cr. Capital Stock
With an explanation showing the issuance of the stock dividend charged to Surplus.

This type of reserve may be considered as an earmarked portion of surplus, in the same way as the reserve for sinking funds are portions of true profits, or they may be a valuation reserve resulting from a bookkeeping charge to profit and loss. In this latter category, a contingent reserve may be deemed a measure of an ascertained loss which is taking place or is about to transpire.

The presence of such reserves connotes a degree of conservatism on the part of management, in providing for possible unforeseen and in some cases predictable losses. All business is subject to hazards of various types. Prudence dictates that they be provided against. The larger the scale and the broader the scope of operations generally, the more serious are the destructive forces that must be guarded against and the larger should be the insurance carried, in the form of a reserve of profits that can be used to tide the concern over financial emergencies. A business operating in several score of states and in foreign countries, by the fact of being exposed to various legislative, judicial, and regulatory bodies and to various uncontrollable physical conditions, must be protected to a greater extent than a business that confines its scope of operations to a restricted territory of known physical characteristics and predictable social attitudes.

Some of the possible losses which cannot be reduced to an actuarial basis for positive predetermined computation, but which should be recognized by management and provided for in contingent reserves, are those due to:

1. Catastrophes, such as floods, tornadoes, marine losses, wrecks, fires, etc.

2. Unfavorable legislation or decisions on the part of state or federal governmental agencies or through the confiscatory acts of foreign governments.

3. Expansion of state and federal police power covering such things as pure food legislation, improved sanitary conditions, improved working conditions, traffic control, fire

protection for the public and working men, industrial compensation, etc. All these control regulations are desirable from a social standpoint; they often come as a result of propaganda or reform movements, but nevertheless they exact a toll in reduced profits from the concern directly affected.

4. Possible adverse legal decisions where the company is involved in protracted litigation.

5. Unfavorable business conditions. Reserves against this type of loss might better be carried under "surplus" or dividend reserves, if it is desirable to carry forward a continuous dividend policy.

Some authorities would restrict the use of contingent reserves to those liabilities that are of a contingent nature, such as accommodation indorsement, guaranty of bond principle and interest, etc. Such items should be shown in the reports to give proper notice to interested parties; however, the use of contingent reserves should be for a broader type of potential loss. A restricted dividend policy and the existence of substantial contingent reserves is necessary for full insurance.

Extraneous Losses and Gains.—A report on the surplus of a business is not complete without a history of the extraordinary losses and gains covering past years. Such a history should cover the amount of such items, the causes for the losses or gains, and the possibility of their recurrence. If the surplus is made up in any considerable part of extraneous gains, the question is, "Can future gains from the same source be considered permanent or irregular?" The same information should be given regarding losses.

Profits Available for Dividends.—The dividend policy of a board of directors is a factor to be considered in selecting investment and credit risks. Generosity in paying out profits, in order to maintain security prices or general credit conditions, may be a desirable thing. However, the policy of draining working capital may be carried too far for the immediate welfare and the ultimate solvency of the concern. No definite answer can be given as to the proper amount of dividends that can safely be paid out. The important factors are: (1) the fluctuation in the past net earnings, (2) the per cent of earnings paid out as profits, and (3) the amount of payments in stock dividends.

No financial report of a concern is complete without a full report covering these factors.

Surplus Items That Do Not Show Protection

Not all "surplus" items appearing in balance sheets and in ledgers are true surplus, as is commonly understood by accountants and credit men. The reader of statements should be on guard in the interpretation of "surplus," in order to detect immediately the spurious elements that have no place there. The bookkeeping novice and the clever manipulator of accounts may wrongly classify, as surplus, psuedo-liabilities, valuation accounts, and unearned profits, with the result that wrong conclusions may be drawn concerning the earnings, the condition of the financial structure, and hence the safety of an investment.

Appreciation of Property Values.—Unrealized profits which have resulted from the appreciation of plant values have no place in the surplus of any going concern. The writing up of real estate, buildings, equipment, or any other property owned, results in the showing of so-called "profits," which from all conventional practice are not accounted as business gains. A going concern does not hold its plant for resale or for speculative purposes. True, if a sale or liquidation were made at a time of high prices, a profit might be realized.

But to anticipate such a sale or liquidation by preregistering the hoped-for profit and to show the unrealized gain as an accomplished fact, is to state an untruth. Profits are made as the result of a sale, and not by the increase in value due to a reappraisal, which simply reveals the fact of a change in the purchasing power of the dollar, or perhaps the local appreciation of real estate values. A footnote in a financial statement is a sufficient notice of increased prices. The surplus should not register it.

Furthermore, if the increase in value has been caused by a change in the price level, consistency would dictate a policy of writing down the value of property which previously had been written up. But if the showing of surplus profits resulting from the appreciation of assets, causes a greater payment of dividends, and a corresponding decline in working capital, a real menace has been created in the existence of this fictitious surplus.

If the plant or equipment is written up, the temporary profit will inevitably disappear later through an increase in the annual depreciation charged to profit and loss. The appreciation of assets does not increase the life of property. The increase in the depreciation charges on a $500,000, 20-year plant, which has been appreciated 50%, will be $12,500 per year. The owners of stock at the time of the write-up, if dividends are paid, will gain at the expense of subsequent owners of stock, who must stand the increased depreciation charge and a depletion of the working capital. Thus the practice gives to the insiders a chance to manipulate the accounts.

Equipment Made by Firm.—The same general effect upon the ledger accounts and the financial statements, and also the same type of manipulation, is brought about through the writing up to market value of tools and equipment produced by the concern or purchased below market. Such goods should be carried at cost of production or at cost. Profits are not made in the saving in production costs or equipment used in the plant. The ultimate profit is realized in the lower cost of production of the finished products, due to a lower interest carrying cost and in the lower depreciation charge on the equipment made in the plant.

Uncompleted Contracts.—Uncompleted contracts carry no profit that should be shown in the Surplus account if there be any appreciable risk involved in finishing the contract. To show a profit on uncompleted work, that may involve the contractor in a possible future loss occasioned by such hazards as strikes, possible increased wages and material costs, or possible losses due to physical factors, is to misstate the truth. Even though the sale has been made and the legal claim for compensation has been established, the cost of the sale has not been determined, and hence the profit is an unknown factor. Practice and logic prohibit giving such unearned profits a place in financial statements. They do not afford any protection of the investment.

If the contract calls for full payment on the completed portion of the work with no recourse against the contractor for the unfinished part, a profit has been earned. Such arrangements are exceptional, however.

Inter-Company Profits.—Inter-company profits which have arisen from the sale of goods from one unit in an organization to another unit, are not true "profits." The fact that Branch A has produced goods and sold them to Branch B at a net gain to the former, does not mean that a profit has been made by Branch A and Branch B combined. The profit is made in such cases only when the goods are sold to outsiders. The combined inventories of the two units contain an element of inflation amounting to the inter-company "profit." "If it is not possible to get such actual profit figures, an estimated reserve should be provided, based on information obtainable, to exclude the approximate amount of profits . . . which has accrued to the department or subsidiary (company) selling the same. . . ."[3]

There is no protection of the investment in inter-company or inter-departmental "profits." For the same reasons as outlined above, all of the so-called "profits" which have arisen from the overvaluation of any and all assets, or the undervaluation of liabilities, have no place in the surplus statement.[4]

Donated Surplus.—A donated surplus will show protection of the investment as an addition to net worth only to the extent that the donation is genuine and not the result of a gift whose measure is the inflation of the property turned over to a corporation in payment for stock. If the original assets prior to the donation were fairly valued, and if the donated stock were sold and the money employed in building up the corporate estate, the new property acquired and its representation in the donated surplus, would be a bona fide security factor and would function no differently from profits made from operations.

Donated surplus that has its measure in unsold treasury stock has very little protection value. The sale of such stock, which is necessary to give real potency to the donated surplus, has not been consummated and if the market for such securities is limited, the protection element as such is almost nil. At least the sale potency of treasury stock is but little better than that of unissued stock. If, however, the treasury stock has a ready and demonstrable market, the surplus has strong presumptive elements of protection. But even here the surplus should be reduced by the amount of possible future discounts occasioned by the sale of the donated stock. In all events, the donated surplus should not be represented with the "operating" surplus, but should be shown separately under its proper title.

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[3] Montgomery, Auditing Theory and Practice, Vol. I, p. 152.

[4] For a more detailed statement concerning the principle of valuation of assets and their direct effect on the surplus, see Chapter VIII.

Assessments, Premiums on Stock and Bonds.—There are three elements sometimes shown in the surplus but which should be segregated:

1. *Stock assessments* made on assessable stock and collected in cash. Such an assessment, while showing an addition to the proprietorship as a matter of fact, registers financial difficulty and is often made as a last resort to avoid financial insolvency. The device is frequently employed by development companies in the promotion stage.

2. *Premiums on stock* (sold) are the same as paid-in capital. In some cases they are classified as "surplus" and there is no law at present preventing the payment of cash dividends created by premiums on stock. The practice has little sanction among accountants or business executives. There is a possible element of investment protection in stock premiums, due to the fact that the redemptions of the securities sold at a premium usually are made at par.

3. *Premium on bonds* (sold) is not considered surplus, but deferred interest, as the latter item is amortized by a periodic credit to bond interest and a charge to bond premium. The inclusion of the total bond premium in surplus at the date of the sale of the bonds, causes an unwarranted increase in the surplus that might result in a greater payment of dividends, which obviously are not earned at the date of the issue of the bonds.[5]

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[5] The proper accounting for bond premium is as follows:

Dr. Cash	$755,000	
Cr. Bonds Payable		$750,000
Cr. Bond Premium		5,000

To record the sale of bonds at a premium.

The amortization of the bond premium at the date of the payment of the semi-annual interest charge is as follows:

Dr. Bond Premium
Cr. Profit and Loss

CHAPTER X

PROTECTION OF THE INVESTMENT—REPLACEMENT RESERVES

Protective Function of Replacement Reserves.—No investment is fully protected without adequate reserves having been put aside out of profits to cover the cost of renewing all worn-out assets at the time they are scrapped or at the expiration of their legal life. It is universally recognized that all property loses value with use, with exploitation, or with the passage of time. Perpetuity of existence is inherent in practically no property used for productive purposes.

The concern that fails to take account of this inevitable loss in value, that pays out all income in the form of dividends, that fails to conserve and dedicate new property values for the replacement of the old property, is courting inevitable financial trouble. The original investment gradually is being repaid to the stockholder as a return of the principal. Income thus recorded is not earned; and the person who relies on the statement of a concern that fails to take depreciation into account, is being seriously misled. The holders of long-term securities, such as bonds and mortgages, under such a policy might be compelled to witness the gradual wasting of their property and the payment of its value to stockholders, under extreme cases, with the accompanying shrinkage in the security back of their investment.

With what funds may property be replaced if it is thus dissipated through the payment of income? Only through the floating of new securities to rebuild the old plant. Such a course would tend to cause a double issue of securities, once for initial financing and again for refinancing the replacement of units. It means, furthermore, that the surplus, if there be one, is in part a mere valuation account and not a true profit.

In modern times inadequate reserves for replacements usually indicate one of two things: (1) manipulation to inflate the surplus, or (2) ignorance of sound business practice.

It is axiomatic that if the price of the final product is made up without the inclusion of the prorated change for the wastage of physical property, consumers are receiving goods below actual cost of production, and in reality are receiving without charge, the value of the plant along with the goods purchased.

Adequacy of Depreciation Reserves.—At best, depreciation is approximate and all reserves are more or less unscientific. No infallible measuring device for determining plant value exists where human judgment enters so largely into the question of depreciation rates. The problem of the adequacy of reserves in the balance sheet is largely a question of checking physical appraisal with plant performance.

In examining plant values as a check on the adequacy of depreciation reserves, the important question is not so much the age and former productivity of the plant, but the possible future service. Present age and serviceability are not the essential criteria of present value; because values attach to future and not to past service. The uncertainty as to plant value, and as to the question of the adequacy of reserves, lies in the lack of knowledge of the life expectancy of individual equipment and its future productivity.

The probability of error covering future service tends to decrease as the end of the theoretical age is approached. The greatest error in computing annual service value of a piece of equipment is found at the date of installation, due to the fact that all of the factors of usage, aging, extra load factors, possible neglect of repairs, to which equipment is subject, are wholly in the future and therefore unknown, whereas these uncertainties tend on the whole to eliminate themselves, as the end of service life is approached.

The determination of depreciation rates for the replacement of industrial equipment has not been reduced to an actuarial basis, and it is doubtful if the layman can expect to find a reliable index of reserve requirements in financial statements alone, published by operating concerns. The problem is essentially one for the engineer and varies with local conditions of physical operations.

Reserves and Plant Efficiency.—Can the efficiency of a plant be predicated on the size of depreciation reserves? It is sometimes stated that a reserve for depreciation should not exceed a given per cent of the value of the machinery, building and equipment, and that a composite reserve for the plant as a whole above this size would indicate a subnormal operating condition and incidentally a weakened financial structure.

It would appear that a confusion exists here between two standards of measure, one a check on productivity, the other a check on value. The two are not the same. Serviceability of plant may be kept at or near par through a systematic repair and unit replacement policy covering small parts, and output can be kept practically the same for an indefinite period of time. But the value of the plant as a whole is gradually lessening through the wear and tear or the rendering obsolete of parts which cannot be replaced or repaired. If this irreplacable value is large compared with the value of that portion which is readily substituted with new units, there will be a general lack of correlation between depreciation reserves and general plant efficiency. The plant that is made up of a large number of units replaced at fairly regular intervals, requires a relatively smaller reserve for depreciation than in the case where the major portion of the value is found in the heavy parts that are not replaced in small units, but scrapped as a whole at the end of their service life. A light-duty sawmill that can be replaced in parts, can be kept more nearly at par in value through unit substitution, than can a hydroelectric plant and dam that cannot be completely repaired, but are torn down and scrapped as entire units.

The absolute amount of the reserve, then, cannot function as a measure of efficiency. In the case of the electric plant, the reserve might conceivably run as high as 75% or 85% of the total plant value, and yet it might not register any serious loss in efficiency. If, on the other hand, the sawmill which requires fairly constant repairs to maintain it at par in service, is found to carry a relatively heavy reserve for depreciation, a condition of excess depreciation or deferred repairs and replacement exists. As each renewal is made, a charge to the reserve registers a lowering of the reserve, and an improvement in the plant. Hence, a nominal reserve is the expected normal condition. Neglect of the replacement of integral parts causes an accumulation of reserves but only in a general way registers a lowering of the vitality of the plant.

In short, then, where productivity depends upon frequent renewals and unit repairs, the reserve tends only in an indirect way to measure plant efficiency. Otherwise as a quantitative measure, a depreciation reserve is ineffective for the purpose.

Periodical appraisals of the plant, coupled with a check up on the depreciation rates used by the accounting department, must be employed for verifying depreciated book values. Comparative reports covering repairs and plant performance and not the depreciation reserves found in the financial reports measure plant efficiency.

Absolute and Theoretical Depreciation Reserves.—In another sense, quite independent of any connection between plant serviceability and ledger values, depreciation reserves may be confused as a measure of recognized completed loss in value, i.e., absolute depreciation.

Depreciation policies are often adopted with the idea of maintaining a constant production cost, with the avowed plan of compensating for an uneven maintenance expense. Machines that have a low initial repair[1] cost with a tendency to accelerate with age, are thus given a high initial depreciation rate and a lower rate in after years in order to compensate for this unevenness in expenses. If the plant as a whole is running on a costing system of this or any type which does not match up absolute depreciation with rates that periodically measure actual loss in value, it would be unwise to assume that the reserve at any time would give a fair indication of the shrinkage in value.

If the rate applied in any case tended either to lag behind or to run ahead of the acknowledged depreciation for any piece of equipment or for the plant as a whole, a natural lack of correlation will exist between the depreciated value of these assets as shown by the ledger and a corrected value based on an appraisal.

Reports that feature protection of the investment should clearly indicate any discrepancy that exists between the theoretical depreciation as shown in the reserves, and the absolute or completed depreciation as shown by appraisal or experience, through the use of specially prepared schedules. These schedules should feature the difference between the theoretical operating or cost accounting charge and the actual cost of mechanical deterioration. The latter may be based on standard performance of like equipment under similar operating conditions in other plants, or upon the basis of actuarial computations.

Depreciation and Market Value.—In the lay mind a confusion exists between the depreciation that strictly speaking measures loss due to mechanical factors, and market "depreciation," which measures shrinkage in value due to drop in market values occasioned by (1) fundamental market price changes, or (2) resale conditions.

By definition, depreciation measures loss from neither of these sources. In a going concern the fluctuations in market values of a plant due to any cause, have no place in ledger computations. If a financial report is being used for credit purposes, a footnote indicating market changes ordinarily is deemed sufficient.

Losses that may arise from theoretical resale or second-hand values, likewise have no place in balance sheet reserves.

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[1] A glance at Figure 16 will illustrate the point more fully. AD measures the value, and DB the number of years of service life of an asset. If a check is made at any period of time from date of purchase at D, until the time the asset is scrapped at B, there will be a lack of correlation between the depreciated value measured by line $AC''E$ (representing a high initial depreciation charge) and the loss in value measured by line $AC'E$ (representing straight line depreciation). Likewise a lack of correlation will exist if the loss in value is measured by line ACE (representing a low initial rate) contrasted with $AC'E$. The reserve would be insufficient in the second case and too great in the first case to care for the actual loss in value.

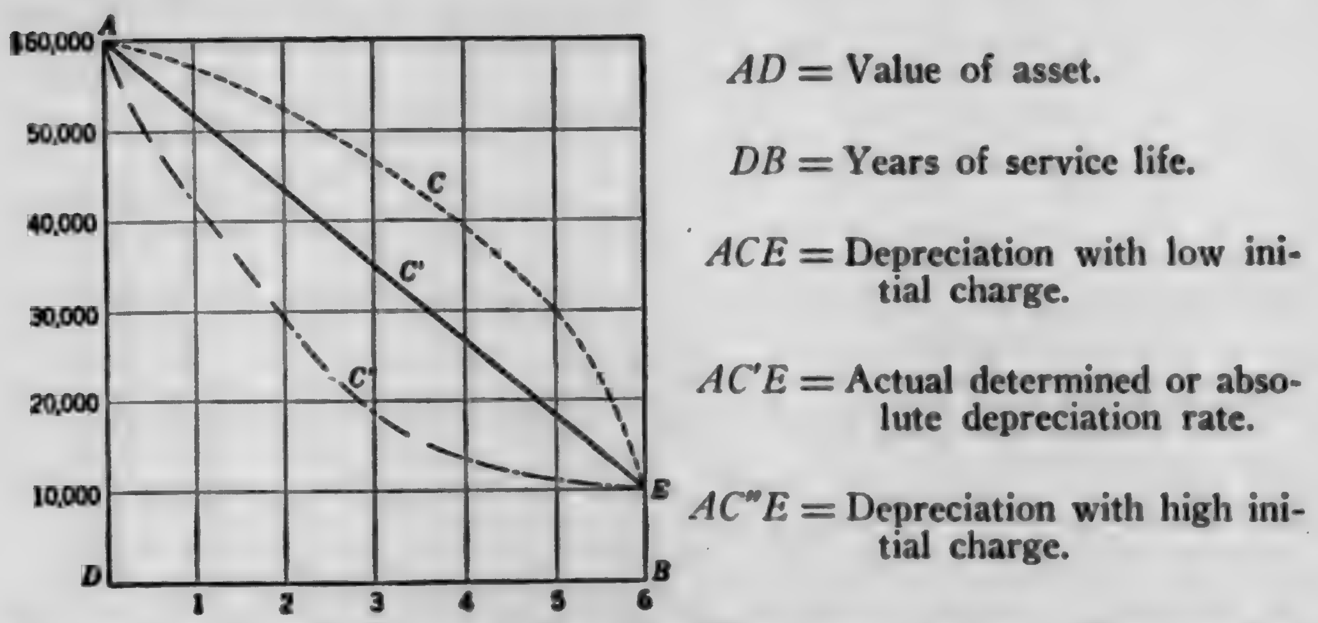

Figure 16. Graph Showing Possible Discrepancy between Absolute and Theoretical Depreciated Values

Yet the protection of the investment is measured by the reserve in either case, by the reader of the balance sheet. If the plant be subjected to idle time or any factor that actually slows down the absolute rate of loss in plant values, the discrepancy would be greater if $AC''E$ represent the accumulation of the reserve. If the plant be subjected to overtime operations, through the employment of extra shifts or speeded work; or if the labor turnover increases and more green labor be employed; or if any factor arises that increases the absolute rate of loss in value, the discrepancy would be less if $AC''E$ be the measure, but greater if ACE or $AC'E$ be the measure of lost value as recorded in the reserve. In all of the above cases, errors will exist in the balance sheet, the extent of which can be determined only by careful appraisals and a review of depreciation policies.

While most equipment, especially rolling stock, such as automobiles, trucks, etc., from a resale standpoint, loses a substantial portion of value when first installed and used, the registration of this loss is proper only where the asset is stock in trade and not a part of the plant used to produce income. Quite true, if the plant is appraised for sale purposes in contemplated liquidation or foreclosure, attention must be paid to the market condition of assets that will receive the acid test of value through resale. Creditors desirous of knowing in advance the possible shrinkage in the bankrupt's property, expect to find in the balance sheet and the property reports, a series of reserves that fully register the depreciation due to (1) wear and tear, and in addition the loss due to (2) lower market prices. A receiver's report is usually considered incomplete without this type of an appraisal.

However, the prospect of forced-sale values is not present in the average going concern, and properly speaking, the reserves should not register the market fluctuations that have no immediate effect upon either the operating conditions or the permanent plant values. Depreciation reserves, then, are not measures of the loss in value of assets due to market changes.

In practice depreciation reserves are affected indirectly by market fluctuations brought about through the increase in the value of fixed assets that have been appreciated by appraisals. This is sometimes done in the case of public utilities that are petitioning for higher service rates. Here the reserves tend to increase through the swollen depreciation rates. In such cases added depreciation rates shifted to the public, amounts to making capital charges to the consumers in the service charge.[2]

Depreciation and Future Replacement Costs.—The increase in the cost of replacing property, due to a change in the price level, often brings about inflated reserves. Toward

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[2] This argument does not deny the fairness of allowing higher rates that compensate for increased operating and overhead costs that have arisen from decreases in the purchasing power of the dollar.

the end of the service life of equipment as the time approaches for its ultimate scrapping, the increased cost of replacement can be more readily ascertained. The increased cost is sometimes erroneously prorated and added to the depreciation rate, in order that a sufficient fund may be provided out of profits with which to purchase the new and more costly plant. The practice is usually frowned upon by professional accountants as it violates the generally accepted principle that allows as a depreciation cost only the prorated annual loss in the value of the initial outlay.

To charge present operations with future added plant costs is to burden the current period with a capital charge, and not an *operating expense,* for the benefit of future operations. The owners of stock, and incidentally, the consuming public, are being assessed today for costs that should be financed out of capital. Future stockholders would tend to gain by the practice. The depreciation reserves would contain in part an element of true surplus.

The rate of accumulation of depreciation reserves may be made to compensate for changes in the market value of scrap material which is ultimately salvaged from the wrecking of the plant. As the market price of the salvage tends to fall or rise, the current depreciation rate is sometimes changed to meet these fluctuations. The practice finds sanction only when the fluctuations represent permanent changes in the value of the scrap and are of sufficient importance to warrant special attention.

Depreciation reserves[3] measure decreases in value from a definite cost figure; changes in the market price of assets and changes in anticipated renewal costs have no place in the computation of present reserves and depreciation rates.

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[3] The bookkeeping entries for the charging of depreciation, obsolescence and supersession costs to profit and loss, and the creation of the related valuation reserves are as follows:

(1) Dr. Depreciation (Obsolescence, etc.)
Cr. Reserve for Depreciation (Obsolescence, etc.)
Explanation showing the necessary computations, the departments involved, etc.
(2) Dr. Profit and Loss
Cr. Depreciation (Obsolescence, etc.)

Explanation showing closing depreciation charge to Profit and Loss.

The various valuation reserves, if the computation has been made correctly, will accumulate to the value of the related asset, less the expected scrap value, during the life of property that is wasting away. At this point when the asset is replaced by a new unit, the following entries are made:

(3) Dr. Cash
Cr. Asset account
Explanation showing the sale of the scrap value of the old asset.

(4) Dr. Reserve for Depreciation (Obsolescence, etc.)
Cr. Asset account
Explanation showing the value of the asset charged to the reserve.

In case there is an overvaluation or an undervaluation of the asset at the time of replacement, an adjustment is made with the surplus. If the reserve is too large, or if the scrap value is greater than originally computed, the following entries should be made:

(5) Dr. Cash
Cr. Asset account
Explanation showing the sale of the scrap value.

(6) Dr. Reserve for Depreciation
Cr. Asset account
Explanation showing value of the asset charged to the reserve.

(7) Dr. Reserve for Depreciation
Cr. Surplus
Explanation showing computation of the overvaluation of the asset at date of replacement.

In case of the overvaluation of the asset, all entries are the same excepting the adjustment with the surplus, in which case the following entry is made:

(8) Dr. Surplus
Cr. Asset Account
Explanation showing the overvaluation of the asset by closing the shortage into the surplus.

Maintenance reserves are sometimes used in place of depreciation reserves. They combine two factors, viz., repairs or general upkeep and depreciation (replacement costs). The combined theoretical maintenance and depreciation cost computed in advance for the full life of the asset is made as a charge to profit and loss and the credit is carried to the Reserve for Maintenance. This makes a constant yearly or monthly charge to operations for repairs and depreciation. Both charges are thus operating expenses or cost factors.

The entry for the maintenance charge is as follows:

(9) Dr. Maintenance costs
Cr. Maintenance Reserves
Explanation showing computation of the prorated yearly repair and depreciation charges.

Depreciation versus Appreciation.—Many business men in computing plant values include the so-called appreciation brought about by such things as increased real estate values, improved organization, the growth in trade and goodwill, etc. This increase in going concern values, they argue, offsets the actual loss in the physical value due to wear and tear. But the question is raised, Is the investor and lender protected by the omission of depreciation and the substitution of appreciation as a corrective? Granted that greater values exist in the assets pledged under a deed of trust, due to the increase in land values, etc., the security holder can realize on this increment only under a favorable sale.

Appreciation normally adds little if anything to productivity, and seldom can be realized upon in liquidation; yet, if the depreciation charge has been omitted and the reserves ignored, the dividend payments possibly may have been larger due to the greater profits registered in the operating surplus. If the practice results in a depletion of working capital and a loss of liquid replacement funds due to enlarged dividends, the omission of the depreciation charge may result in weakening the security of the investment. If redemption and not refunding is the plan of taking care of the liens at maturity, with what funds can the debt be amortized? The appreciated value is not appropriable for the purpose, unless the asset is readily salable, which is not always the case. A going concern can rarely convert real estate increment into liquid form; hence it might be said that appreciation is a fiction so far as current receipts are concerned.

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(10) Dr. Profit and Loss
Cr. Maintenance Costs

As the actual cash repair expenses are made, they are charged to the Maintenance Reserve as follows:

(11) Dr. Maintenance Reserve
Cr. Cash or Accounts Payable

Factory costs are sometimes handled by a charge to operations and a credit to a special reserve. The reserve is later adjusted when all the costs have been computed and compared with the predetermined standard costs.

The depreciation of the plant is a known cost element, the operation of which persists regardless of the market value of the plant. The ultimate loss of the plant represents a shrinkage of the corporate estate, and if ignored in the expense computation, overlooks the patent fact of current loss in investment values, which originally involved a pecuniary outlay. In a going concern depreciation cannot be ignored merely because of the existence of the unearned increment.

In cases where appreciation is recorded in the ledger as a result of a bona fide appraisal, the increase should be shown, not in the surplus account, but in a specially earmarked account called "Profit from Appreciation of Property," or "Appreciation Surplus." Where the increase is not recorded in the ledger, the fact may be shown as a footnote in the balance sheet, a conventional practice for all types of assets where the market price is substantially above the ledger value.

Idle Time Operating Conditions and Depreciation Reserves.—One of the serious factors that militates against the use of balance sheet reserves as absolute measures of reservations covering shrunken values, is the idle time factor. Plants that are inactive for any considerable period of time due to labor troubles, seasonal operations, or protracted business depressions, if the depreciation rates are on a flat time basis, will cause a discrepancy between the actual depreciated value and the ledger value as shown by the books of account and the balance sheet.

Since depreciation is not a function of time alone, but is conditioned sharply on actual operating conditions, it is necessary in checking values to note the extent to which these operating factors enter into the situation of value fixation. Flat rates based on time tend to undervalue assets in a depression, and to overvalue the same assets in a period of prosperity. The same is true where the plant is idle for a portion of the time for any other condition, such as strikes, etc., or where one department of the plant is idle a part of the time due to a lack of volume that keeps a portion of the equipment inactive. Poor plant layout or planning may be responsible for such a condition.

Rates based on "operating time" or "unit output" tend to compensate for the idle time factor. Here the charge tends to parallel the actual wear and tear. However, it must also be noted that prolonged inactivity involves a loss in value because equipment deteriorates when not in use. Special accounting and engineering practice must be introduced where such conditions prevail in order to secure the proper coefficient of loss in value.

Special Operating Conditions and Reserves.—Special operating conditions must also be noted by the accountant, such as overtime work, speeded operations, or unusual labor conditions. Rates planned for a normal eight-hour shift, become wholly inadequate when two and three shifts are involved, or if the plant as a whole is overspeeded or overloaded. Also a high labor turnover, involving the training of new labor, and the attendant strain on machinery, breakage, etc., inevitably breaks the continuity of actual depreciation costs, and in turn invalidates the reserves as true indices of completed loss in value.

Repair Policies and Reserves.—Normal rates and reserves likewise are based on the assumption of a consistent repair policy which has as its object, the active renewal of small parts of buildings and equipment. If, through the necessity of continued plant operations and the inability of closing down the plant as a whole in rush seasons, some critical repairs from an operating standpoint are omitted or delayed, a more rapid deterioration of the plant results than is registered in the theoretical reserve. If the repairs are more actively made, this discrepancy tends to disappear.

Delayed maintenance is a serious factor in the value of all large concerns, especially railroads, and should be checked carefully by the reader of statements. Moreover, delayed repairs of importance cause an overstatement of plant value, because ledger value assumes a normally conditioned plant, and not one below normal.

CHAPTER XI

PROTECTION OF THE INVESTMENT—REPLACEMENT RESERVES (CONTINUED)

The Replacement Policy and Depreciation Reserves.—Many large industrial concerns, public utilities and especially railroads, carry no depreciation reserves as a matter of formal policy. In lieu of charging[1] a yearly flat cost for the theoretical loss in value due to wear and tear, the asset is charged to profit and loss in a lump sum against the income of a single year in which the scrapping of the property takes place. It involves the charging of all renewal and also maintenance costs as expense items without the intermediary of reserves, and treats the replacement of all assets as though it were current expense outlay.

The policy is adequate in extreme cases and gives full protection to the investment. However, the number of cases is relatively small where it is wholly satisfactory, as it does not apportion the cost of wastage evenly between fiscal periods. If the plant consists of a large number of units having approximately the same cost, the same length of service life, and if the items are replaced regularly with the result that the full cost of wastage is assessed equitably to product, it gives a workable plan for cost-keeping purposes and a high degree of security to the investment. But rarely are units of a like type, such as rails, ties, poles, etc., replaced with regularity, but more often in large quantities.

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[1] The significant bookkeeping entries used where a replacement policy is employed consist of the following:

(1) Dr. Asset account
    Cr. Cash or Payables
  Explanation showing the type and value of the asset purchased when first installed.

(2) Dr. Profit and Loss
    Cr. Asset account
  Explanation showing the scrapping of the asset after the sale of the salvage.

The replacement of the scrapped asset with new property is a proper capital charge. No charge (or credit) to profit and loss should be made for the added cost (or saving) on the new asset, even though the new asset is less or more efficient than the old asset. The asset account should carry the cash cost and not a lesser or greater value.

Large capital outlay for the replacement of costly units that wear out infrequently, causes a financial hardship on the finance engineer if values have not been accumulated during the life of the assets to replace the worn-out units. More serious from the investors' and creditors' standpoint, however, is the possible encroachment upon the original capital fund by ignoring the continuing loss that is going on irrespective of the accounting procedure. During the period of time prior to the replacement of the worn-out units, the entire property is shrinking in value, but the income during this time is considered true profit; the estate in effect is being "melted" down and passed out to stockholders in the form of dividends.

Composite Value of Property.—Moreover, at any time subsequent to the date of installation the investment is not fully protected because of the fact that there is a gradual shrinkage in the value of the entire plant prior to the time of the first series of replacements, which receives no compensation in the return of other assets to make good the initial shrinkage. The plant has a 100% value at the time of installation, but thereafter there is a continuing loss in value that is checked only when the full annual replacements cover the completed current loss.

Of the full complement of assets owned at a given time, a small part, those newly replaced, will be new, the balance will be in varying stages of decay, and their value will range from practically 100% to 0%. If the major portion of the items have been newly replaced, the composite value will more

nearly approximate the original value; if renewals have been delayed, a lesser value exists.

Thus it may be seen that a balance sheet report drawn up under such conditions fails to give a true picture of the asset values and the financial condition. The surplus, if there is any, contains an element of valuation, the amount of which would measure the actual shrinkage in property value. The true condition of such a business concern can be ascertained only through appraisals.

While the presence of reserves for replacements in a financial report generally indicates an active depreciation policy, it does not guarantee absolute protection of the property; nor does it indicate the absence of a partial replacement policy, and the possible neglect of depreciation charges covering a portion of the property.

The adoption of a replacement policy would naturally depend upon the general nature of the corporate estate and involves as a matter of policy an analysis of the properties into two broad classes: (1) value groups, consisting of items of approximately the same cost and length of life, and (2) functional groups consisting of units performing like operations, and subject to a common load factor (volume and intensity of operations) and susceptible to a consistent repair and part renewals policy.

Assets that are subject to approximately identical operating conditions, that are of the same cost and length of life, are eligible for a replacement policy. The annual renewal charge on such a large group of like items, because of its continuity, would be practically equivalent to a prorated depreciation charge.

The Fundamental Purpose of the Depreciation Charge.—Any depreciation policy that guarantees complete satisfaction to management, to owners, to short-time creditors, to long-term creditors, to profit-sharing labor groups, in fact to all interested parties, must of necessity combine three harmonious viewpoints, namely: that of the appraisal engineer, the cost accountant, and the financial engineer.

The primary purpose of the depreciation and obsolescence charge from the *appraisal engineer's* viewpoint is that of showing correct values in the balance sheet. This is the problem of protecting the original capital fund entrusted to management. The discharge of his stewardship is conditioned on the retention in the business of revenue producing assets equivalent in value and productivity to the wastage of the fixed property; and incidentally in rendering revenue receipts unavailable for distribution among the stockholders in the form of dividends.

The emphasis lies essentially on the proper exhibition of facts that tend to prove the existence of the physical corporate estate in its original entirety.

The *cost accountant's* viewpoint emphasizes not so much the fact of correct appraisals and balance sheet valuation, but more of the computation of scientific depreciation and obsolescence charges as prime factors in determining correct costs of production. This is the problem of weighing the physical factors of the plant, that enter into the problem of price control of the finished products and incidentally in the problems of credits, which have to do essentially with the collection from the consumer of the prorated costs of production. The emphasis lies in the correctness of the charge to product.

The *financial engineer's* viewpoint is that of the banker whose task is the financing of replacements at the time assets are scrapped. The emphasis is less on appraisals or protection of the corporate estate, or on theories of the burden charge of depreciation; but since the prime interest is financial rather than rate making, the problem of providing reserves is subordinated to the question of whether the business can afford the charge for depreciation. In short, where the finance viewpoint is predominant, the charge is often varied with the size

of income. It finds its expression in the reports of concerns that are closely allied to the promotional and stock market influence that tends to feature dividends rather than security.

The desideratum in depreciation accounting is to make a fair and equitable maintenance charge to each unit of product. The correct charge to a product through the use of scientific depreciation rates, *ipso facto* makes adequate provision for financing renewals and results automatically in the safety of property investments and a fair valuation of assets as represented in balance sheets. In any accounting plan adopted, whether it be a depreciation policy or a replacement policy, due weight should be given to the continuity of the dividend policy and the credit standing of the company.

However, the fact of depreciation and the showing of loss in values as revealed in the reserves should not be subordinated to the showing of true profits, because net gains are determined only after all expenses, including depreciation, have been determined. In short, depreciation charges should be made every year regardless of the general credit condition and earnings of the firm. Delayed maintenance and depreciation charges causes deliberate misstatements of balance sheet and income reports.

The Protection Afforded by Reserves for Depletion.— Protection of the investment in cases where the assets consist of property items that completely waste away with exploitation, presents a different problem to management than where the property can be replaced or repaired and the total estate kept at a par value. An original investment in physical equipment such as rolling stock, buildings, machinery, etc., can be safeguarded and maintained as previously indicated, by the process of reinvesting a portion of gross income in like or similar types of equipment as fast as the old becomes worn-out or obsolete; or the reinvestment may take the form of dissimilar but productive properties.

In cases where the industry is not a continuous one, and where the assets are completely and irretrievably lost through exploitation, the only process of saving the original investment is through a reinvestment of a part of the gross revenue in other revenue-producing property. This process of integration tends to keep the value of the estate intact, but not necessarily in the same general line of business. Protection will result if profits are reserved and reinvested in amounts equal to the loss due to exploitation.

However, if the entire income is paid out to stockholders, let us say, of concerns engaged in timber and logging operations, or those engaged in coal and iron mining and similar types of exploitation, and no reservation of profits is made for renewing the original values invested in such wasting assets, it follows that a portion of the original investment will be annually returned to the stockholders in dividends under such a policy.

The holder of bonds of a company that is working such properties loses a portion of the security back of his investment to the extent that the dividend checks contain a return of capital. The usual safeguard in such cases is the sinking fund provision that compels the issuer to retire a portion of the debt out of income at a rate that will give the holder ample protection. Preferred stock that has been issued against such property tends to lose its security if not similarly protected.

The Problem of Capital and Revenue.—A more serious problem exists where stock of such concerns is held in trust for the life-tenants who are given the "net income," with the stipulation that "the principal be granted the remainderman upon the death of the life-tenant." Just what is "net income" becomes a complicated problem, especially where the trustee has no ready means of checking the accounting and engineering practice of the issuer.

If adequate records are kept showing the original cost of the property exploited, the total quantity of product originally estimated by the engineering staff contained in such property, together with a report showing the annual quantity produced, a figure of unit depletion cost and the total reservation that should be made for a stated period of time can be ascertained.

If, for example, an original property containing 500 million board-feet of lumber and costing $500,000 is exploited at the rate of 45 million feet per year, the annual depletion cost would be $45,000, or $1.00 per thousand feet, and a reservation of gross income to make good this loss should be set aside. If the producing concern does not make a reservation of this amount, but passes all income on to its stockholders, it would be incumbent upon the trustee in the above case to divide the dividend check between "net income" and the principal. The portion of returned capital would be the ratio of the total annual depletion cost to the total income distributed as dividends. For example, if the total paid-out income including depletion, in the above case, were $545,000 and the depletion cost were $45,000, 8.25% of the dividend check would be capital.[2]

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[2] Special note should be made of the fact that depletion cost is an operating expense chargeable to profit and loss, and not a segregation of surplus. While the reserve if properly kept, marks the accumulation of other property which replaces the wasting assets, and as such belongs to the owners, the reserve marks the wastage of the property and is a valuation reserve. The cost of production properly includes the depletion expense and the price of the final product must be made sufficiently high to cover it. The journal entries together with a proper explanation for the annual depletion charge would be:

(1) Dr. Depletion
Cr. Reserve for Depletion
To credit the Depletion Reserve for the annual loss.
(2) Dr. Profit and Loss
Cr. Depletion
To clear the depletion expense into Profit and Loss account.
(3) Dr. Reserves for Depletion
Cr. Property Account
To close the Property account into the Reserve account marking the final exhaustion of the wasting asset.

(See following page for balance of footnote.)

Protection of the Investment Afforded by Reserves for Obsolescence.—There are many industries which suffer severe losses through the necessity of scrapping portions and sometimes entire plants because of far-reaching improvements in the arts that are occasioned by important new processes, patents, etc. These rapidly moving changes are usually beyond the control of management. The "revolution" in productive and distributive technique induced by such changes often results in the complete destruction of plant values within a comparatively short time.

No industry is entirely free from this industrial hazard, especially where inventions are frequent or where the product is seasonal or subject to faddism. Examples of this kind of loss are numberless, some of the more important ones being the changes in the production of synthetic nitrate fertilizer, and the virtual scrapping of the old industry; the electrolytic process for the production of aluminum that caused the junking of the old sodium plants and the complete annihilation of the old aluminum producers; the Bessemer steel process that caused important changes in the old steel manufacturing methods; changes in fashions in radio receiving and others.

Other changes in the arts may be more gradual in their introduction and may cause less serious losses in plant and equipment values due to the fact that the improvements are within the control of management. The introduction of the automatic telephones was largely timed so as to replace equipment that had become worn-out through service, with the result

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Any correction in the figure of wastage of any prior year, should be made through the surplus account with this entry:

(4) Dr. Depletion Reserve
Cr. Surplus
To decrease the depletion reserve and increase the surplus, correcting the former overcharge for depletion.

(5) Dr. Surplus
Cr. Depletion Reserve
To reduce the surplus and increase the depletion reserve, correcting the former undercharge for depletion.

that small losses were incurred by the telephone companies in replacing the old equipment.

Reserves for Supersession.—Again, certain equipment may be installed with the expectation that it will be superseded by larger and more productive equipment, to accommodate a growing market, to take care of increased traffic, or for other reasons that call for an enlargement of the plant. It is often cheaper to carry a light duty plant that involves an annual supersession cost, for the sake of future expansion in the scope of operations.

The fact that obsolescence[3] is a possibility, subjects an investment to a potential loss that must be taken into account by the accounting department. This is done by reserving profits out of surplus to make up the loss, the rate of which is based on qualified expert opinion. A conservative program calls for both depreciation reserves and also reserves for obsolescence and supersession. The adequacy of existing reserves in the balance sheet is a question of the law of probability as it affects changes in certain types of industrial processes.

Obsolescence of City Office Buildings.—The report of the Taxation Committee of the National Association of Building Owners and Managers, covering 155 office buildings of Class A construction in 40 cities in the United States, disclosed the fact that for the first 28 years of life, the gross income was practically constant, with expenses on the increase. After this period both gross income and expenses declined, with the buildings fast becoming second-class structures. The increased cost for replacements soon placed the buildings in the non-income-producing class, which tended to render the investment in buildings valueless.

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[3] The question as to the classification of reserves for obsolescence may be answered in the words of Montgomery, in "Auditing, Theory and Practice" (1927), p. 380, where he states: "Allowances for extraordinary obsolescence are in the nature of contingency reserves, because they anticipated the unknown. It is not proper to make charges against income for reserves unless the ultimate disposition of the reserve is reasonably certain."

A series of causes resulting in the obsolescence of such buildings are: (1) increased land values in the business district, (2) shifting of business center, (3) changing types of construction, and (4) minor causes. The normal growth of a business district results in much higher land valuations. The above study of 155 buildings showed that within 50 years the value of the land had become six times that of the original buildings themselves. Consequently, increased returns were necessary to give a profitable return on the increased values. This factor alone readily tends to make a building obsolete.

Representative cases show that a building may become obsolete due to the shifting of building centers in 15 to 39 years, a considerable period before its physical life has expired. The type of construction is continually changing with improved methods of construction. In fact in the near future we can look for this factor to be of even greater importance. An example was cited of a building in Seattle which was built in 1916, and in 1923 the owners were seriously considering demolishing it. Minor factors causing obsolescence are: the fact of the oldness of a building, etc., location, size, and service features, the type of equipment such as electrical fixtures, plumbing, etc., in new buildings—conditions that caused tenants to move to the newer locations.[4]

Reserves for Expiration of Legal Life and Intangibles.—There are many assets carried by modern industrial and commercial concerns that derive their entire value from certain legal sanctions granted by the state, which guarantee privileges and immunities to the grantee. Such rights may give a monopoly of the use of properties or processes and are based on a definite tenure of time. Patent rights, copyrights, trademarks, franchise rights, limited rights-of-way, riparian rights, water rights, terminable leaseholds, are cases of property rights based largely, if not entirely, on the fact that certain future monopoly advantages inhere in their ownership.

At the expiration of these rights, and in many cases prior thereto, not only the invested values, but also the earning power and sometimes protection of the industry, cease to exist. It is the passage of time that causes this decrease in value, and unless there are compensating factors to offset this loss, the prorated loss should be set aside in special reserves and the cost charged to profit and loss.

All other property items whose value is coterminous with the legal tenure of these intangibles, likewise should be amortized ratably and charged off to profit and loss as a cost of operation. Buildings or fixtures that are erected on leased ground and that revert to the landowner; plant and equipment constructed on riparian rights and limited rights-of-way lost by the lessee to the landowner or to the state, likewise should be charged off as losses, on the basis of elapsed time.

Specific reserves covering losses of this type should be found in all balance sheet reports that show ownership in property rights of a strictly legal nature. To pay out profits without first reserving a sufficient amount to replace the lost values, amounts to a repayment of capital to stockholders to the detriment of all creditors. Some possible right to suspend such a charge may be found in cases where the asset having a legal life has been purchased for corporation stock and not for cash, in promotion cases.

Amortization of Intangibles Favors Promoter.—The practice of charging off "legal tenure" assets and other intangible assets, either to profit and loss as an operating expense, or to surplus as a capital loss, in effect amounts to the "sale" of the intangible asset to the other stockholders who are virtually cut off from dividends during the time the charge to profit and loss is being made as an expense. Current income is reinvested in the corporate property and finally takes the form of miscellaneous tangible assets. The intangible, through the periodic amortization charge, will disappear, and in its place will come bona fide property. The "sale" will require some time for its ultimate consummation. The full realization of the transaction is found at the time of the dissolution of the company when the corporate property is sold.

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[4] H. J. McIntyre, Thesis—An Investigation of the Depreciation of Office Buildings. Graduate School University of Washington (1924).

All readers of financial reports should be on guard so as to ascertain, first, the real value of these assets, and second, the policy of the accounting department regarding their amortization. If real value exists in the intangibles and consideration has been paid for them, the only thoroughgoing policy is protection through amortization and the creation of reserves. Before the stock sold for cash can have a book value equal to or above par, profits equal to or more than the value of the intangible must be accumulated. If the firm is dissolved before such an amount of profit has been accumulated, the holder of "cash" stock must divide the tangible assets with the holder of the stock issued for the intangible. In short, the promoter can withdraw cash paid in by the other stockholders.[5] The same

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[5] The following accounts will illustrate the case:

BALANCE SHEET AT DATE OF ACQUISITION OF FRANCHISE

Franchise	$200,000	Stock	$300,000
Miscellaneous Property	200,000	Bonds	100,000
	$400,000		$400,000

BALANCE SHEET AFTER ACCUMULATION OF RESERVE FOR EXPIRATION OF LEGAL LIFE FRANCHISE

Franchise	$200,000	Stock	$300,000
Miscellaneous Property	200,000	Bonds	100,000
Current Assets	200,000	Reserves for Franchise	200,000
	$600,000		$600,000

BALANCE SHEET AFTER CHARGING OFF RESERVE FOR EXPIRATION OF LEGAL LIFE

Miscellaneous Property	$200,000	Stock	$300,000
Current Assets	200,000	Bonds	100,000
	$400,000		$400,000

The capital stock in the latter illustration has tangible property back of it that makes its book value equal par. The reinvestment of the $200,000

situation is true regarding the writing off of goodwill, organization expense, discount on stock, or any other intangible asset possessed by a company and charged to profit and loss or to surplus.

Protection of Investment Afforded in Reserves for Potential Inventory Losses.—Reserves for possible losses in inventory values covering raw materials, finished goods, securities, etc., indicate that management is alive to the fact of possible shrinkage due to sudden drops in market prices of goods held, and has provided for such losses by a charge to operations or to surplus.[6] A corrective is thus introduced into the balance sheet figures acknowledging in advance any anticipated losses that affect the current period's profits when the goods are made or purchased.

Like all other similar reserves, it checks the drain of working capital in so far as accounts are used by management in initiating control programs. A smaller surplus generally would lead to the payment of smaller dividends. For balance sheet

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in earnings withheld from stockholders has been necessary to accomplish this. The current assets take the place of the former franchise account, and are shared by all stockholders alike upon dissolution.

[6] Reserves for inventory losses are created by a charge to operations or by a charge to surplus and a credit to the reserve, thus:

(1) Dr. Profit and Loss or Surplus
Cr. Reserve for Inventory Losses
Explanation showing computation of the potential inventory loss.

The reserve valuates merchandise inventory, securities, foreign exchange, or other current assets, and appears in the balance sheet as an offset to these items, or acts as a contingency reserve.

During the fiscal year following their setting up, the reserves are either held as reserves or credited to the asset involved. The effect of the profit and loss or surplus charge is properly to assess the loss to the period in which the loss was ascertained.

The bookkeeping entry for closing the reserve is as follows:

(2) Dr. Reserve for Inventory Losses
Cr. Merchandise, etc.

In many accounting systems the reserve is not closed but is kept open. Adjustments are made for the difference in the values of the inventories for two years by a debit or credit to surplus or profit and loss. This plan is not as satisfactory as the practice of closing the reserve, as it does not keep each year's entire loss separate.

purposes the reserve for inventory losses indicates a reduction in value of inventories below cost or market price. The reserve serves its greatest purpose in periods of business prosperity when prices are high and declines most imminent. It is then that earnings are often greatest, and special reserves can be made without serious inroads on surplus profits.

Immediately after the war the heavy losses in such commodities as rubber, sugar, wool, steel, etc., in part, could have been better absorbed if more profits had been kept in business instead of being paid out in dividends. Cash would have been provided for replacing the serious inventory shrinkage.

Where the concern carries a sizable inventory of securities either for investment or for secondary reserve purposes, or any considerable amount of foreign exchange, reserves for these items indicate conservatism in the valuation of these assets, in the showing of true surplus, and in conserving resources through a more moderate dividend policy.

Protection in Insurance Reserves.—An added list of potential losses to which all business concerns are subject and upon which management should report in detail to stockholders and other interested parties as a part of the discharge of their stewardship, is the series of physical and personnel hazards that have in part been reduced to an actuarial basis, and upon which insurance policies can be taken out. The possible losses from fires, boiler explosions, wrecks, etc., in large part can be insured through the payment of premiums or by the carrying of company insurance.

Many industrials, public utilities, and quasi-public utilities do not insure their property because the cost of premiums over a period of years amounts to more than the actual losses of property. Where no insurance is purchased, reserves of profits are made annually on a strictly actuarial basis. The charge is made to operations for this expense on the ground that the usual insurance cost is considered as an operating expense and not an appropriation of surplus. Management usually is not charged with setting aside a specific fund to cover replacements from these types of losses. If a full reserve of profits has been made, the protection is deemed sufficient.

The raising of money with which to refinance the destroyed property is not unlike the problem of financing any replacement. The adequacy of such reserves to cover all potential losses normally is not subject to check by the layman, but is based purely on statistics of a highly involved order supplied by the statistical department. The report covering insurance may be supplied by this department, but more often is furnished by appraisal experts or insurance underwriters, and covers: (1) lists of all property subject to loss; (2) the uninsured and uninsurable (exclusions) assets; (3) the type and amount of insurance carried; and (4) provision for company insurance in the insurance reserves. Since the surplus account broadly may be considered a contingency reserve in many concerns, the adequacy of the provision for company insurance may be found in the size of the surplus.

Personnel Hazards.—The "personnel" hazards, or those that arise from the purely personal element in the business, cover a broad list of possible losses, as that occasioned by theft, embezzlements, defalcations, incendiarism, sabotage, and anti-social acts in general. Institutions whose properties are easily subject to the depredations of the morally delinquent, should require a greater protection than otherwise. Such insurance generally is covered by the purchase of insurance policies. Seldom are special reserves set aside for losses of this type.

Labor troubles are hazards, the costs of which are very infrequently covered by any type of special insurance. Surplus earnings kept in the business may be said to cover all ordinary losses caused by protracted labor disturbances, which vary with the type of business. There is no question that strikes, lockouts, etc., have resulted in serious inroads on earnings, and even caused business failures. The important question is whether management has taken full cognizance of the hazard and has provided the firm with staying power in the form of surplus profits that might be drawn upon as occasion demanded.

A final type of personnel hazard is the loss brought about through the possible demise of certain staff members and owners whose strategic position so dominates a business concern that their deaths would seriously impair its success. Life insurance is frequently taken on such men and made payable to the firm. Often such premiums are featured in financial reports among the tangible property items, at cash surrender values.

Protection of the Investment Afforded by Secret Reserves.—Secret reserves are hidden profits not disclosed in the accounting records or reports, and if present in any considerable amount, give an added security and protection in the same way and to the same extent as ordinary profits which are formally registered in the surplus account.

Secret reserves have their substance in (1) actual property values that are not inventoried, or held below book values; or (2) in the false creation of liabilities that do not exist but have been brought into the records to cover true profits.

The records may be falsified as a formal policy aimed at the misstatement of records; for the manipulation of balance sheet reports, for the purpose of freezing out minority stockholders by a reduced profit-showing; or it may be done for the sake of the protection of the investment, or possibly through ignorance of standard accounting practice.

Manner of Creating Secret Reserves.—The hiding of assets may be accomplished in the accounting records in the following ways: (1) charging off property to profit and loss (buildings, furniture, and fixtures carried at a nominal figure of one dollar, usually indicate secret reserves); (2) overcharging for depreciation which enlarges unduly the reserves for depreciation, and thus reduces the asset values; (3) overcharging for bad debts, which reduce unduly the value of customer accounts; (4) carrying final inventories at excessively reduced prices; (5) crediting income to an asset account which reduces the property values instead of increasing the profit statement; (6) carrying expense supplies and miscellaneous inventories, at excessively low prices; (7) creating a fictitious debt by charging it to an operating account and carrying the item as a bona fide credit (liability) that reduces the profit showing in the same way as in the case of the reduction of an asset charged to profit and loss.

It is argued that all secret reserve practices are contrary to sound accounting, that they lead to misrepresentation of facts and that they serve no useful purpose which a true showing of facts in the reports cannot give.

The existence of secret reserves, while usually frowned upon by accountants because of the misstatements of the records, finds justification on the part of some business men in the fact that they aid in maintaining the credit standing of a firm. If a sudden large operating deficit is sustained, the secret reserve can be brought into existence in the reports, and made to absorb the loss. This practice frees the current operating report from the loss, enables the firm to continue its surplus position unimpaired, and thus tends to maintain security values in the open market. Stocks and bonds react sympathetically with changes in the operating fortunes of the issuing concerns, and any factor, it is argued, that tends to stabilize profits protects security values for owners.

Classification of Reserves.—Throughout the discussion of the protection of the investment afforded in various types of reserves, it will be noted that no clear line of demarcation was drawn between the types of reserves. All reserves protect the corporate estate; some function differently than others.

Valuation reserves (those that show shrinkage in property values) guarantee the holder of corporate stocks or mortgage securities, that the estate is being kept intact by the filling in of property (in the first place of cash) at a rate commensurate with the gradual loss in value of the major property items due to wear and tear, the passage of time, etc. If the accounting records have been kept correctly, the valuation reserves measure the upbuilding of these new values, and keep the profit showing at its correct level, thereby shutting off the overpayment of dividends and the draining out of working capital, the very substance of the corporate investment. To the credit department, valuation reserves give a corrected value of assets owned by debtors.

The second broad type of reserves, namely, the proprietorship or "owners'" reserves, is the mark of the true addition of values over and above the original values invested and replaced in the estate. The existence of proprietorship reserves, per se, registers the fact of the conservation of property plus the addition of new values either in the form of new property or the reduction of liabilities.

CHAPTER XII

CONTROL OVER CREDITS AND COLLECTIONS

Analysis of Accounts and Notes Receivables.—From the management viewpoint the question of control over receivables resolves itself into two problems: (1) the control over credit extension and collection policies; and (2) the proper showing of notes and accounts receivable in a statement of financial condition, as represented by the balance sheet. The problem of the extension of credit to customers, involving as it does the risk of collection from a varied group of business concerns, is a highly specialized and technical work, and requires the services of an expert who should be placed in full charge and held responsible for the operation of the credit department.

Credit Department Standards.—A few factors which have proven successful, over a wide field, in conducting a credit department are here given as a starting point in the matter of control.

1. It is necessary to take the extension of credit from the hands of the salespeople who make sales to credit customers. Salesmen are usually desirous of making sales, and in many instances are unacquainted with the problems of business management of clients, hence unable to rate the most important factor in judging ability to pay. By placing the credit department in the hands of an expert who is conversant with the fundamental business problems of customers, and who is in an independent position and uninfluenced by the desire of making sales, there is less likelihood that credit will be extended to those unable to meet their debts at maturity.

2. Credit statistics of a broad, comprehensive nature should

be collected concerning the financial status of customers, more particularly with respect to the relative size of the owner's investment as compared with the total debts, the convertibility of assets, and their liquidation values at a forced sale; the technical ability, experience, former success, and moral responsibility of owners, together with a history of their previous buying methods; also their method of paying bills, advertising policies, business location, and other data that bear upon the question of the ability and willingness of customers to pay. In some cases these statistics can be profitably extended to include data on the basic industrial and commercial characteristics of the trade territory served, also its population types and their approximate purchasing power, in order to determine the economic and business conditions that contribute to the economic welfare of customers.

3. Supplemental credit information may be secured from mercantile agencies, from local bankers and attorneys, and also by the exchange of ledger information with other concerns serving the same customers.

4. The length of the credit terms should be kept as short as is consistent with good merchandising. The usual credit period has a direct connection with losses from bad accounts. A business with enforced collections at the end of 30 days will have fewer losses from bad debts than if the terms are extended to 60 days or longer.

5. Collections may be made more brisk through the judicious use of sales discounts allowed customers, handled by the sales department or the collection department. Variations in the rates may be used for the purpose of changing the sales price to meet competition. This practice must not be confused with the allowance for prompt settlement of accounts. The drawing of sight or time drafts on customers for the amount of sales above a certain minimum figure, aids in speeding payments on a portion of sales that might otherwise be granted credit.

Cost of Carrying Receivables.—Goods sold to customers involve the creation of a contract obligation for the full price of the sale. When analyzed into its elements, a sale covers the original cost of the goods purchased or manufactured for sale, plus any carrying costs allottable to the goods sold, and in addition an amount sufficient to cover a profit. The most serious loss involved in the non-collection of accounts receivable is the cost of the goods and the prorated selling, administrative, and financial expenses. The obligation of the seller for the original cost of the goods must be met and the payments for clerk hire, rents, etc., must be made whether customers cooperate in paying their financial obligations or not.

The cost of carrying customer accounts is no different from the carrying of any other property owned by the business. There is no essential difference between the investment in building and the investment in receivables, so far as the cost of carrying them is concerned.

An obligation for interest or dividends is involved in both cases. If the amount of receivables is greater in one period than in another, an added expense for interest is incurred for carrying the increased accounts, as more money must be borrowed in order to carry them or to pay the creditors who are paid for the cost of goods sold. If the added receivables represent slow collections and not an extension of new credit, it involves an added cost which the firm must stand for its inefficiency. It means that a portion of the current liquid assets is becoming less liquid, and the credit with the bank or general creditors is becoming strained, due to the fact of slow collections, since for every dollar added to the slow collections amount, a dollar must be borrowed.

Moreover, the longer an individual account remains outstanding, the smaller will be the net profit made on the sale to the customer. If, for example, the net profit on sales amounts to 5%, or $5 on a sale of $100, and the credit term taken by the customer is extended through poor collections to four months, the cost of carrying this sale on borrowed funds at 6% would be $2, thus leaving but $3 as profit, a net reduction of 40% in the net profit. Not only is the profit lost but the credit of the firm is strained unnecessarily due to the necessity of asking for credit.

The profit can never increase, as it is at the maximum, but for every day the account is outstanding an added expense is incurred for the interest on the cost of the goods sold, also on the overhead expenses paid to carry on the business and charged to the customer. The only portion of the sale not carried as an additional element is the net profit of 5%, or approximately 10 cents for the four months.

However, the cost of bad debts per dollar of sales tends to cover this latter item, so it may be said that the added cost of carrying receivables, covers the full amount of the account and for the full time it remains uncollected. Hence the need for speeding up collections and increasing the turnover of accounts receivable is of paramount importance for refinancing new sales and saving added carrying costs.

Technique for Controlling Collections.—The most efficient system of control over the collection department is to be found in the credit department records of delinquent customers' accounts and bad debts. It is customary in many large concerns to have a roster of slow-pay customers that are transferred from the accounts receivable ledger to a "doubtful account" ledger. Upon this list the follow-up letter and collection work is concentrated. The measure of efficiency of a collection policy, or of the work of one manager compared with another, or one year with another, may be determined by the ratio of the amount of credit rejected to the total sales turned over to the credit department, coupled with the amount of accounts which are ultimately lost. Possible sales of $194,444 per year, with a credit elimination of 10%, gives net sales passed for credit of $175,000. Here the credit department has the opportunity of controlling the bad debts before they have occurred. It is generally considered safer to refuse a doubtful account and save the cost of the merchandise and collection expenses than to allow the sale to be made with the hope of recovering these costs.

Natural conservatism on the part of the credit manager keeps the figure of credit rejections high, a fact which tends to cause a loss of sales. To insure the harmonious working of the sales and the credit departments, figures may be introduced to show the relation of credit refusals to the savings of bad debts. The smaller the amount of refusals, the greater would be the ultimate loss from collections; and vice versa, the larger the amount of refusals, the less should be the loss.

The point of maximum yield from credit extensions would be the point where bad debt losses tend to equal the loss of profit from the extra sales made to marginal[1] customers that are passed for credit. Credit refusals to this type of customer involve a possible loss of profit on the rejected sales, which becomes an opportunity cost. However, the passing of these border-line sales involves a possible loss from poor collections.

To insure a rigid collection policy and also to give an immediate check on the efficiency of the collection policy, all accounts over 90 or 120 days, according to a prearranged plan, should be charged off to profit and loss as uncollectible. This does not mean that the accounts are forgotten or that no further attempt will be made to collect them. On the basis of a percentage of sales rejections and a policy of charging off all accounts over 90 days, a comparison is given to management of the ratio of rejections to ultimate losses. On the basis of the credit manager's own selection of good and bad accounts an immediate report is made.

External Checks Over Receivables.—Two methods are available for checking the efficiency of a collections policy, where the data of the percentage of sales refusals to bad debts cannot be secured. These are useful in determining standard performance of clients to whom credit has in turn been extended, or of concerns which are otherwise under examination. They are: (1) the turnover method, (2) average days' sales outstanding method. These might be termed "external" measures, as contrasted with internal measures.

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[1] A border-line customer from the credit point of view.

The Turnover Method.—The term "turnover" implies the number of times per period a certain value enters into and is taken out of a given total. When applied to customers' accounts it means the number of times per year that the average amount of receivables is sold and collected during the period. For example, if the outstanding accounts at the beginning of a year were $25,000, and at the close of the year are $30,000, the average of $27,500 would represent the average amount carried by the business throughout the year. With annual sales on account of $175,000, the turnover of receivables would be 6.36 times per year. If the turnover for the subsequent period under comparison indicated a turnover of 8 times, it would show that collections were more prompt and that fewer delinquencies existed in the outstanding accounts. If, on the other hand, the turnover had slowed down to 5 times per year, the conclusion would follow that more credit had been extended, in terms of a greater credit length, or that the collections were less prompt, with the result that more delinquencies in the accounts existed.

Standard Accounts Receivable.—In any given case the normal receivables can be predetermined with mathematical accuracy. The measure is the days of the year divided by the number of days of credit granted. For example, if the net credit terms are 30 days, the turnover would be 12 times per year. Annual sales on account of $175,000 sold on net 30 days' time will give a computed amount of outstanding receivables of $14,583, providing credit terms are fully observed

by customers. In any given case, if it is found that the amount is greater than the standard figure, the excess would represent delinquencies in collections running an indeterminate period of time.[2]

The illustration below shows the effect of a slow turnover of receivables on the average day's credit together with the delinquencies resulting therefrom. With an assumed credit of net 30 days, the report for 1926 shows an added extension of 15 days taken by customers who have failed to pay on the due date.

Year	Sales on Account	Credit Terms Actually Taken	Turn-over Rate	Average Accounts Outstanding
1925	$175,000	30 days*	12	$14,583.33
1926	175,000	45 days	8	21,875.00
1927	190,000	40 days	9	21,111.11

* Figuring 360 days per year

The overdue accounts for 1926 amount to $7,291.67, compared with the normal expectancy. During 1927 with sales amounting to $190,000 and the rate of turnover of 9 per year, the days of delinquency have been reduced by 5, while the amount of overdue accounts has been reduced by $2,638.89, compared with the preceding year. The increased sales naturally would give a larger amount of receivables outstanding, but in 1927 the amount of trade debt was approximately the same as in 1926, due to the improved collection effort.

The Average Daily Sales Method.—This method approximates the one described above, in the fact that it features the number of days' sales which are contained in the present outstanding accounts.

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[2] The assumption here is based on the fact of uniform sales made through the year, a condition, of course, not found in actual practice.

The number of days' sales outstanding in receivables equals the sum of these accounts divided by the average daily sales. The average receivables outstanding in 1926 of $21,875 gives an average daily sale of $486.11, or 45 days of sales uncollected. In 1927, by the same method of computation, the number of days' sales contained in the receivables will be found to be 40 days, or $527.77 per day. The direct comparison for control purposes is the increase or decrease in the number of days' sales outstanding, and is found by dividing the accounts receivable by the average daily sales for the period.

Effect of Sales Discounts on Average Age.—The previous methods of computing the age of accounts receivable practically ignores two important things: (1) the percentage of accounts paid within a given discount period, a figure that shows the total amount of credit sales repaid within the discount period; and (2) the amount and arithmetical average age of the accounts failing to take advantage of the discounts—two vital factors in credit information where an examination is being made from financial statements. While the two previous methods indicate a method of determining the amount of delinquent accounts where no discounts are taken, they overlook the effect of sales discounts as factors to be reckoned, in computing the average age of accounts.

A percentage of all customers that take discounts can be found by comparing the actual sales discounts taken with the total discounts offered. If the sales for the year of $175,000 showed possible discounts of $5,250 on a 3% in 10 days, net 30 days basis; and if the discounts actually taken amounted to $3,675, an average of 70% of the customers are taking 3% in 10 days. Thirty per cent of all credit customers are not paying up their accounts in the 10-day period. It follows that this latter 30% contains all the potential delinquencies, those customers who withhold payment for full 30-day period, and those who ultimately become overdue.

One measure of the efficiency in collections where discounts are involved will be found in an improving percentage of customers that take advantage of the discounts offered. Various methods have been suggested to this end, which can be merely mentioned in passing, as they belong to the field of credits—a closer supervision of credit extension, a better selection of credit risks, granting larger sales discounts to the point where the added discount cost tends to equal the cost of bad debts.

How to "Age" Trade Accounts Where Sales Discounts Are Taken.—If the records are open for inspection, the exact age of the trade debtors can be found for all delinquencies, which can then be classified, without resorting to "averaging," as accounts which are 60 days to 90 days overdue, those 90 days to 120 days overdue, and those over 120 days old. In case no records are available other than the profit and loss statement, the balance sheet and a knowledge of the trade discounts (external measures), the averaging method must be used. However, these statement data furnish a complete set of tools for the purpose. Where increasing amounts of sales discounts are indicated in the statements, the average age of the outstanding accounts will be greater if the ratio of sales to receivables remains relatively unchanged. Enlarged discounts should be reflected in a smaller amount of outstanding trade accounts in normal cases.

This can be proven by constructing a hypothetical standard for the two situations, one where no discounts are taken by customers, and the other where discounts are taken in stated amounts. For example, if we take a case of average daily sales of $1,000 or $30,000 per month, ignoring holidays, with credit terms of net 30 days, and if no discounts are indicated in the statements, the standard or normal receivables would be $30,000, or 30 days of sales.

If, however, it is ascertained that 40% of the customers in a second case take advantage of discounts (found by comparing discounts taken with the total possible discounts allowed), the standard outstanding receivables would be $22,000. This assumes that sales are made ratably throughout the period. This can be verified by referring to Figure 17 which covers sales, collections, and discounts, covering 60 days, a period of two credit cycles.

According to this illustration, during the first 10-day period, sales will amount to $10,000.

Theoretically no collections will be made in this interval, as the full 10 days will elapse before any discounts will have been taken. During the 11-20 day period, sales will amount to $10,000, while collections will amount to $4,000, or 40% on the 1-10 day sales. During the 21-30 day period, the sales will amount to $10,000, while collections will amount to $4,000, or 40% of the 11-20 day sales. During the 31-40 day period, sales will amount to $10,000 while collections will amount to $10,000 instead of $4,000.

This $10,000 in collections will consist of two parts: one, $4,000 covering the 40% collections on the 21-30 day sales, and the other, $6,000, which covers the 60% collections on the 1-10 day sales which were made 30 days previously. On these latter sales the customers lost all discounts, but paid in the net 30 days' terms. During the 41-50 day period and every 10-day period thereafter, the sales and collections theoretically will be the same in amount. That is, $10,000 will be sold, while $4,000 will be collected from the discount customers, and $6,000 will be collected from customers taking 30 days for payment.

At the point where collections of a given amount equal the sales, or as a matter of fact, at any point of time thereafter, say, at the end of a fiscal year, it will be found that the outstanding accounts of $22,000 contain three elements: (1) the last ten days' sales of $10,000, from which no collections will have been made, and from which no discounts will have been taken; (2) the preceding 10 days' sales of $10,000, less the

$4,000, the latter representing collections from the discount customers that have taken advantage of the 1% discount; (3) the first 10 days of sales, or $10,000, less the $4,000 collections taken by discount customers.

Periods in Days of Month	Sales	Collections
1–10	$10,000	None
11–20	10,000	$4,000 (40% of 1–10 day period sales taking discounts)
21–30	10,000	4,000 (40% of 11–20 day period sales taking discounts)
31–40	10,000	4,000 (40% of 21–30 day period sales taking discounts)
		6,000 (60% of 1–10 day period sales losing discounts—paying n/30)
41–50	10,000	4,000 (40% 31–40 day period sales taking discounts)
		6,000 (60% 11–20 day period sales losing discounts—paying n/30)
51–60	10,000	4,000 (40% of 41–50 day period sales taking discounts)
		6,000 (60% of 21–30 day period sales losing discounts—paying n/30)
		$38,000 Total Collections
		22,000 Balance Uncollected
Totals . . .	$60,000	$60,000

Figure 17. Showing the Sequence of Sales and Collections Where Discounts Are Taken

Standard Receivables.—Standard outstanding receivables at a given time will equal the total sales covering the period of net credit terms, here of 30 days, less the payment of customers who take discounts. Or to state the case differently, the normal receivables may be reduced to two essential elements: (1) sales which were made in the last discount period of 10 days, representing an amount of $10,000 not due even to take advantage of the discount; and (2) sales which normally are not paid until the end of the net period of 30 days, representing an amount of $12,000.

Attention is directed to this last block of $12,000 (in reality two blocks of $6,000 each), due to the fact that the amount contains a known quantity representing accounts that have passed up discounts, which we might call for lack of a better name the "legitimate" lag in trade debtors. It is the normal undiscounted, unmatured trade debtors. In any given case the figure may be secured by deducting from sales made during the full credit period, here 30 days, (1) the sales made in the last discount period (1% in 10 days), and (2) the collections made during the full credit period (net 30 days). The collections should check with the ratios of actual discounts taken to possible discounts.

The Measure of Delinquents' Accounts.—Any amount of accounts receivable found in an actual case, above this figure, represents delinquencies, that is, collections which have gone beyond the full credit period of 30 days.

The point should not be lost that sales here are assumed to be continuous from month to month, and that in considering a month's sales, there is a carry-over from the previous month. The same will hold true of collections and payments on account, the point being that in any given case there will be outstanding an average month's sales less the average collections as indicated by the discounts taken.

Average Age of Slow-Pay Customers.—After having found the amount of the "legitimate" undiscounted, unmatured accounts, the next problem consists in finding the average age of the accounts standing at date of closing. The method at best is based on averages, and as such does not take the place of a detailed analysis of the accounts.

If $12,000 is the "legitimate" lag in collections, i.e., standard slow-pay customers, or those taking full 30 days, at any time, assuming the above conditions, the number of months

of accumulation of slow-pay customers will be found by comparing the standard unmatured accounts with the figure of undiscounted and uncollected accounts outstanding.[3] To illustrate, if the average sales were $30,000 per month; the credit terms 1% in 10 days, net 30 days; and if 40% of the customers on an average took discounts, in a given case of $37,000 outstanding receivables, the average age would amount to 2¼ months. That is, there would be a full 2¼ months of back accounts uncollected, amounts that run for an indefinite time but whose average age is 2¼ months. The actual undiscounted uncollected receivables ($37,000 — $10,000) amount to $27,000; the normal or standard undiscounted uncollected receivables amount to $12,000. This is found by deducting from the normal sales made during the 30-day credit period ($30,000), the amount of customers who took discounts ($8,000) plus the sales made during the last 10 days ($10,000).

300 -
.40
120.00

$$\frac{\$37{,}000 - \$10{,}000}{\$30{,}000 - \$8{,}000 - \$10{,}000} = 2\tfrac{1}{4}$$

The measure of efficiency in this case would be the reduction in the average age of slow-pay customers in the accounts that pass the full credit term. Perfection of course would give zero months over and above the amount that legitimately belong there, in this case of $12,000.

Valuation of Receivables.[4]—Management is confronted with the problem of placing a value on the outstanding customer accounts, at the close of a fiscal period, for the pur-

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[3] If we let S equal the total sales for the full credit period (30 days), D equal the sales during the last discount period (last 10 days), and C the collections from those who take discounts, the formula for finding the standard undiscounted uncollected accounts would be $S—D—C$.

If we let R equal the actual trade debtors in any given case, the average age of the slow-pay customers would be:

$$\frac{R-D}{S-D-C}.$$

[4] For a more extended discussion of the question of valuation of Trade accounts, see Chapter VIII.

pose of, (1) giving a true idea of their value to stockholders, bankers, and credit men generally; and (2) to ascertain at the time of closing the books the probable amount of loss incurred from the injudicious extension of credit, which should be charged off to profit and loss during the period in which the sale was made. Passing the loss on to the time when it is finally realized in some subsequent period, violates a rule commonly accepted wherever sound accounting practice prevails, which is that all known or estimated losses should be recorded when and as ascertained. Such a loss represents a shrinkage in operating profits, and to overlook willingly such a patent fact by overstating a gain, is not only bad form but is injurious to the financial standing of the publisher of the misstatements.

Bad Debts Based on Previous Experience.—Past experience within the business itself is the most effective control device found for estimating probable losses from bad debts. A check on the number of customers who have taken discounts, also the number who have failed to do so, may be made, together with the average daily or monthly delinquency as noted previously. In addition, the listing of the accounts due, overdue by 15 to 30 days, those 30 to 60 days overdue, those 60 to 90 days overdue, and finally those over 90 days, should be made.

If the firm has adopted the policy of rigorously charging off all accounts to profit and loss that are over, say, 90 days past due, a rule is given immediately for ascertaining the amount which may be set aside for possible future losses, in a reserve, or charged off as an admitted and final loss. Again, the policy of creating a bad debts reserve may be adopted by taking an average of past losses as based on the average 90-day accounts carried, or of 60-day accounts, or a combination of the two. Or again, the charge may be based on the ratio of past losses to the month's delinquencies carried. However, in all cases the estimate is made to cover credit sales uncollected, and no reference need be made to total cash sales, as it is from the account sales that all losses are sustained.

Losses from Sales Discounts and Collection Costs.—By the same analysis, operating losses and reduction in values due to the taking of possible sales discounts by customers should be recorded in the reports, based on experience figures, by the use of sales discount reserves. Collection costs from a control standpoint are incurred for collecting all accounts, good and bad, and since no allottable portion may be charged to bad accounts alone, the collection department expenses on anticipated bad debt losses are not made in advance, but are considered a normal annual expense; hence no reserve is made for them.

Miscellaneous Receivables.—Miscellaneous receivables other than amounts due from customers should always be shown separate from the trade debtors records. Items due the firm from subsidiary or affiliated concerns, money loaned or advanced to officers or employees, claims for tax rebates, freight claims on damaged goods, money paid on options or contracts, deposits on contracts, amounts advanced as prepaid rentals, amounts due from stockholders, and minor miscellaneous claims for cash payments—none of these accounts have a legitimate place in the register of accounts normally labeled as "due from customers."

Often these nondescript items amount to a considerable sum of money and present a serious problem in collections. The obvious method of controlling them is to place the granting of such credits with the credit department or some responsible person where active supervision may be secured. The uncertainty of collections would indicate the necessity of setting aside a reserve to cover losses. The losses can hardly be based on experience as they are all irregular in their occurrence. Conservatism would sanction a large charge-off in most cases.

To include such items in the customers' accounts would obviously vitiate any comparisons of turnover rates, ratios of outstanding accounts to sales, potency of sales discounts, length of credit extension, delinquencies, and finally the comparison of credit rejections to delinquents and bad debts control. These miscellaneous receivables have no place in the customers ledger, largely for the reason that they break down the standard measurement of credit extension and control over collections, and for another reason fully as important, namely, that they prevent the proper showing of financial reports when used in credit work.

Control Over Notes Receivable.—Notes receivable if classified properly should consist of notes and acceptances from customers only. Miscellaneous notes from any other source should be shown in a separate account, if present in any noteworthy amounts. Since notes do not follow the conventional credit terms granted customers on merchandise bills, the plan of checks and controls over them must be changed to meet a condition which in many cases represents delinquency extending for a period of time beyond the net credit period. This does not apply to installment notes which are regularly granted in large amounts and which can be controlled under the same general plan as outlined for open accounts.

Since the request for credit extension and the use of notes in some cases is equivalent to a warning from particular customers that the latters' working capital is short, and that they are virtually asking for an added investment in their business, a little more precaution may be needed in handling these cases.

If in the usual course of business, the average note credit extension covers 60 or 90 days, a figure of turnover for notes receivable during the year may be secured. This rate of turnover may be determined by comparing the average amount of notes outstanding for the year, with the total amount of credit turned into notes during the year. Thus, if the average term of notes were 45 days, an expected turnover should be 8 times per year. If the average notes outstanding were $15,000, and the total of the open accounts turned into notes during the year were $60,000, the turnover would be 4 times, and the average note term 90 days. A check may be had by comparing the notes outstanding with the sales on account. However, this latter plan lacks the close correlation afforded in the comparison of notes to the volume of note credit.

Valuation of Notes Receivable.—From the balance sheet standpoint the representation of customers' notes brings forth two important problems: (1) the value of the notes themselves, and (2) the reserve for bad debts on notes. Problems of the valuation of notes are not essentially different from the valuation of accounts receivable. However, if the notes are non-interest bearing until maturity, conservatism would dictate that they be written down by the amount of discount. The bad debts allowance is largely a question of experience based upon the records of prior losses.

CHAPTER XIII

CONTROL OVER WORKING CAPITAL

Deficiency in Working Capital a Cause of Business Failures.—According to the reports of the leading statistical and credit rating houses, the law of probability gives to the average new business concern, a one-to-eight chance of surviving for a period of a single decade. That there are as many firms remaining in the field as long as they do, it is claimed, is due to the generosity and not the good business sagacity of credit departments. Approximately one-third of all business failures, it is said, is caused by the single factor of "lack of sufficient working capital," which can be interpreted as an attempt to do too large a volume on a limited capital.

Some writers and not a few credit departments have accepted the conventional two-to-one ratio of current assets to current liabilities as being a safe rule to follow, in so far as they base credit on the strength of financial statements. If a merchant is deemed a good "personal" risk and if his cash, merchandise, and current receivables are better than 200% of his current debts, he is often rated a "safe" risk. However, if his balance sheet shows something less than a two-to-one ratio, his rating is often reduced, and in many cases he is refused credit.

But is this rule of thumb measure of the purely business risk a safe one to follow? Cannot the capital requirements of a business be planned and that of a going concern tested as to its adequacy, with a greater degree of mathematical precision? The two-to-one rule used occasionally at the present time indicates the psychology of the financial liquidator. The members of the credit departments who apply it to a given case, naturally

think of the borrowing client, not so much as a continuing successful borrower, but more as a possible bankrupt. They are thinking in terms of salvage, not so much of financial facilitation. What will be the ultimate value, the credit man asks, of the borrower's inventory, receivables, and miscellaneous assets at a forced sale, or under a declining market?

Credit Needs a Question of Budgetary Control.—But, on the contrary, the real emphasis is not, "How much can the assets shrink before creditors lose?" but, "Has the merchant a sufficient investment in his business?" Will his normal receipts pay all debts as they fall due? The credit problem is one primarily of budgetary control; not of salvage. It is true that the possible shrinkage in the current property items must be taken into consideration when credit is extended by wholesalers or banks. But the point made is that if a proper ratio of inside equities to outside equities in current assets is insisted upon by credit men, one of the first and most prolific causes of failure will have been removed.

In order to finance successfully a concern through a crisis and a depression, the time when most businesses fail, and the time when credit terms of bankers and wholesalers are more strictly enforced than at any other period, the financial manager should expect his creditors and his banker to "carry" only that portion of his average inventory and accounts receivable which the business itself will pay out within the time limit of the credit terms. This is equivalent to saying that a business must be completely self-liquidating, and that the current collections must pay current outlay of all kinds, including bank loans. An example will clear up this point.

In a cash business where the assets turn more slowly than the liabilities, there will always be a shortage in the receipts from sales, when it comes time to meet debts. The "payable" cycle will have been completed and the full amount of debts will be due, whereas the asset cycle will have been only partially completed. Concretely, if the working assets available for liquidating debts turn 2 times per year or once every six months, and the payables turn 6 times per year, or once in 60 days, only one-third of the working assets will have been converted into cash at the end of the 60-day credit term.

Two-thirds of this asset cycle is still uncompleted, hence two-thirds of the value represented by the inventory is tied up and unavailable for debt payment. If the proprietor bought all goods on open account to start his business, and he proposes to invest that portion of his debt not covered by the normal receipts in the case just cited, the required investment would be two-thirds of the average inventory. In short, the proprietor must own that portion of his merchandise on his shelves that cannot pay its own way.

Turnover of Current Assets and Liabilities.—The critical factor in the successful financing of any business is, in the last analysis, found in the relationship between the rapidity of turnover of working assets[1] and the rapidity of turnover of the

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[1] The turnover of current assets is a common expression found in trade parlance, and is taken to mean the number of times per year that the current assets complete the cycle from cash to merchandise, to accounts receivable and finally back to cash. This turnover of working (or trading) assets is a composite factor, representing the cycle of two interdependent values, namely, the turnover of merchandise stock-in-trade (cost of sales divided by the average inventory), and the turnover of accounts and notes receivable (the account sales divided by the average amount of accounts and notes outstanding).

A stock of merchandise may turn 4 times per year, but if the completion of the cycle results in the extension of longer credit to customers, the turnover of the entire working asset fund is slowed down. A quick turning stock does not necessarily mean a high degree of the liquidity of the value tied up in the inventory, as is often argued by those who advance the idea that theirs is a versatile enterprise because of small stock and rapid turnover. The essential factor is the return of trading items to cash; and if the cycle must be carried through receivables, it follows that the turn of the entire fund must be taken into account in computing credit risks, and not alone the revolution of a part of the fund, namely, merchandise. Mathematically, the turnover of working assets may be found by dividing total sales by the average amount of current assets.

The "turnover" of payables, to use a coined phrase, is an equivalent expression to the turnover of assets. If assets "turn" a certain number of times per year, in like manner it may be said that payables make a definite number of turns per year. The number of turns would be dependent upon the length of the credit terms granted; 30 days' credit equals 12 turns per year.

payables (length of credit terms granted by bankers, wholesalers, and jobbers). It is self-evident that the shorter the credit terms granted to a firm by creditors, if the turnover of working assets remain the same, the more money must be invested in the business. A merchant who has 10-day credit extended to him, must pay his bills more promptly than the man with 60- or 90-day credit. The former cannot rely on the collections from sales to pay current liabilities to as great an extent as can the latter; and not only must he pay his bills more promptly, but he must own outright a greater percentage of his current working assets.

Size of Investment Depending on Turnover Rates.—On the other hand, the more rapid the turnover of his merchandise stock and receivables, the smaller will be his necessary investment. A merchant who is granted 60-day credit on a bill of goods by wholesalers, for example, may be able to turn his stock-in-trade into cash completely within a 30-day period. How much capital need such a merchant have in his business? None, it is answered, because the returns from his sales will always be sufficient to pay his debts. The merchandise stock will turn twice before his bills fall due. A renewal of his stock at the end of 30 days need cause him no worry, as it likewise can be turned into cash before payment is due. An investment in working assets will be required here only if the conditions change, either through slowing of the stock turnover caused by seasonal variations, or through the shortening of the credit terms extended to him by wholesalers.

If, then, the business is thus self-sustaining, what becomes of the popular two-to-one liquidity ratio? Has it any meaning other than a desire to compel the entrepreneur to insure his stock to at least one-half of its value for the benefit of creditors? But why 50%? Some merchandise shrinks 75% and even more at forced sales.

Turning now to the other extreme, take the case of a merchandise stock turnover of twice yearly, coupled with a credit extension of 10 days from wholesalers. If it requires six months to sell the entire original stock, and if it is customarily renewed as sold, and if the cost of the merchandise must be met in 10 days, the owner must invest an amount equal to far more than one-half of the average inventory as a matter of financial necessity. The liquidity ratio must be much greater than two-to-one. True, if the profits are sufficiently great to pay back the entire cost within 10 days granted by the wholesaler, a two-to-one ratio might suffice. But such gains are inconsistent with current merchandising.

Required Ratios.—It follows, from the above illustrations, that the necessary investment in working or current assets may vary from practically 0%, or even less, in such concerns as public utilities, to 100%. Stated differently, the ratio of liquidity may vary in successful going concerns from ¼ and ½ to 1 ratio, to practically a 100 to 1. The former condition exists where the assets are less than the liabilities, indicating a negative working capital found in a self-liquidating business, where all financing is done by the creditors, due to a very rapid turnover of current assets. The latter indicates a virtual ownership of the entire business by the proprietor, with little or no extension of credit due to the great disparity in the rates of turnover.[2]

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[2] A typical shoe store, the annual cash sales of which are $240,000, fairly evenly distributed throughout the year, with a gross trading profit on sales of 33 1/3% and a merchandise turnover at cost of twice yearly, would have a cost of sales of $160,000, and an average inventory of $80,000. If the shoe merchant, for example, to start the business, bought the entire inventory of $80,000 on net 60 days terms, and sells for cash, and if his overhead, including the salary of the owner, uses up the gross profit, the receipts from the cost of sales collected during the 60-day period will be one-third of $80,000, or $26,667. This latter amount will be the only fund available for payment on the indebtedness of $80,000. The gross trading profit on sales as noted above is required to pay running expenses and cannot be used for the purpose of reducing the debt. Hence the balance of $53,333 must be invested by the owner of the business. This is his required investment if he lives up to his credit obligations in full, and does not resort to bank credit.

Within the 60-day term extended to him, the total sales on a mark-up basis will amount to $40,000. Of this amount 33 1/3%, or $13,333, will be

Statement of Credit Rule.—To state the proposition mathematically, in a cash business the per cent of the trading assets which a concern can successfully carry on credit, is directly in proportion to the ratio of the turnover of the trading assets to the turnover of the payables. Current assets that turn 3 times per year, as against a turnover of 8 times per year for payables, could successfully carry a debt equalling three-eighths of the value of the entire trading assets at cost figures. The required investment or working capital would be the balance of five-eighths of the amount of merchandise carried on the shelves plus other assets carried.

The Rule Applied to a Going Concern.—It might be questioned whether the rule applies to a going concern where purchases and receipts from sales coincide throughout the year; where the average business does not purchase once a month but many times; and where it appears that current receipts can be applied to current debts. The answer is, that so long as there is a time interval or a lag between the date of a purchase and the final collection from the trade, the cost of the purchase must

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required to pay overhead expenses, while the balance, 66 2/3%, or $26,667, will be the only amount available for payment on account. However, the full amount of the invoice is $80,000 and since only $26,667 has been collected at the end of the credit term and applied toward the debt, the deficiency of $53,333 must be met by the owner. Within the 60-day period of credit extension, the merchandise stock has made one-third of its completed cycle. If the stock be replenished throughout the period to keep the average inventory up to $80,000, the credit which this concern can carry at all times will be one-third of the average stock-in-trade, or $26,667. If a greater amount of credit is granted, the creditors will be obliged to "carry" the merchant until such time as net profits make up the difference between the safety limit and the credit extended.

If we let A equal the value of working assets, TW the number of turnovers of working assets per period, tp the number of turnovers of payables per period, and L the amount of current credit in dollars which the business can carry safely, the expression would be:

$$L = A\left(\frac{TW}{tp}\right).$$

Working capital (that portion of current assets owned outright by the proprietor) would be expressed thus: $W = A - L$. The current ratio would be: $\frac{A}{L}$.

be met in part by the proprietor. Current receipts do not pay for current purchases.

If it requires six months to completely "turn" a lot of 18 pairs of shoes of a certain line invoiced at $100 at cost, and if the bill for this invoice must be paid within two months, the receipts from this $100 lot taken in within the credit cycle of 60 days will be only 33 1/3% of the total amount due. If the money received from the sale of other lines be diverted to meet the remaining 66 2/3% due on this invoice, from what source can money be secured with which to meet the first obligation? Each turn of assets must pay its own way. To shift receipts from one line to pay for another line that does not liquidate, merely delays payment on the invoice which is deprived of its payment. So long as any debt falls due before it becomes self-liquidating, an investment must be made by the owner, or delayed payment to creditors equal to the deficiency will result.

Investment Factors and the Time Element.—The case may be simplified if expressed in terms of the time factor instead of the turnover of assets and liabilities per period. A wholesaler, let us say, sells a bill of goods to a merchant on 60 days' time, with the agreement that it be paid in full at the end of the term. The merchant, let us assume further, buys the consignment entirely on credit. It is obvious that if he can sell the invoice in its entirety within the 60-day period, and breaks even on expenses so that he does not run behind carrying the overhead costs, he needs no investment. He will need to put money into the enterprise only when it takes longer than the allotted 60 days to sell all of his shoes.

The size of his investment will be equal to the value of the unsold portion at the end of the credit period. If one-half of the stock remains unsold, one-half of its cost must be supplied by the merchant, and the other half will be paid for out of sales. If one-third is sold within the credit period, two-thirds (at cost) must be paid in by the owner. Furthermore, if this rule

holds for the first invoice of shoes purchased, it also applies to all future purchases.

The Asset Cycle.—The factor that determines the amount of the required investment in the above cases,[8] is the relative time required to convert the merchandise stock into cash with which to pay off the debt created to purchase the same stock. A stock of shoes that requires 180 days for clearance, at approximately an equal rate per day, purchased on 60 days' time, will require financing by the owner to the extent of 120 days. In the 60-day period of grace granted by the jobber, one-third of the stock will have been sold. It is assumed here that gross profits pay overhead only and that the net proceeds only are applied to the total debt which will in effect require 180 days to extinguish.

The rule may be stated that the amount of merchandise which a firm can carry on credit is in proportion to the number of days' credit granted (wholesale) compared to the number of days required to convert the stock (at cost) into cash.

The miscellaneous assets, such as prepaid expense items, secondary reserves, cash, etc., must be financed by the owner and carried by him in addition to the prorated amount of the merchandise, receivables, and overhead expense items.

The Rule Applied to Credit Sales.—The above illustrations were based upon the assumption of a cash business. If sales are made wholly upon credit to customers, a new complication enters into the situation, namely, the added burden of carrying the customer accounts by the proprietor. The latter now has investments in three separate and distinct factors: (1) the overhead expense fund which has been advanced to pay operating costs and charged currently to the customers' accounts; (2) the value of the cost of merchandise represented in the accounts receivable; and (3) the value represented in the merchandise inventory at cost. Thus there now exists three distinct "funds," each of which "revolves" (or turns) at its own rate—the expense fund at one rate, the cost of merchandise sold to customers at a different rate, while the merchandise inventory revolves at a rate different from the other two rates. The causes for this disparity in rates of turnover are not hard to find.

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[8] The current ratio for all the public utility group in the United States is .61, showing a negative working capital for this type of concern. This condition is made possible through the very rapid turnover of its current receivables and the absence of slow turning merchandise. See Bulletins 9, 10, 13, 15, Bureau of Research, University of Illinois.

Turnover Rate of the Expense Fund.—The current expense fund, not including items prepaid for a considerable period of time, such as prepaid insurance, rent, etc., represented in the mark-up of accounts receivable in a wholly credit business (profits here ignored for illustrative purposes), is collected with the amounts due from customers. The expense fund revolves more rapidly than the fund used to pay current indebtedness, due to the fact that usually clerk hire, etc., must be paid more promptly than the current payables.

Turnover Rate of the Receivables-at-Cost.—The rate of turnover of the receivables-at-cost is dependent upon the rate of collections, which in turn is governed by the length of credit terms extended to customers and the effectiveness of the credit department in making collections. The size of receivables-at-cost is larger than the expense fund and tends to turn slower than the latter, due to the fact that the money as collected is used for the payment of debts and not for running expenses.

Turnover Rate of the Inventory.—The rate of turnover of the merchandise inventory is different from the rate of turnover of receivables-at-cost, and is governed by the size of the merchandise inventory and the volume of the cost of goods sold. Where credit sales are made, the merchandise simply "turns" into receivables. The greater the cost of sales on account, the more rapid is the revolution of the inventory.

The point to be noted here is that because of the striking difference in the rates of turnover of the inventory, the receivables-at-cost, and the overhead expense fund, a greater discrimination is needed in approximating a rule which will clearly indicate the working capital requirements where all sales are made on credit. The slowness or the rapidity of the turnover of these three separate funds will determine the size of the investment required by the owner in each of these funds. The faster the turnover, the less the required investment; the slower the turnover, the greater the investment, and the less the creditors should be expected to carry.

Expense Fund Separately Financed.—Let us take these funds separately and analyze them further. First, observe the portion of accounts receivable represented by the mark-up on sales, or the overhead fund. In all ordinary cases the expense fund is a separate entity and cannot be used to pay accounts or notes payable. This fund has a load of its own to carry, and has a law of turnover which the manager must observe as a matter of necessity. While borrowings from this fund may be made in small amounts from time to time, the continued use of it for other than expense purposes will result in difficulties from the standpoint of paying the current general expenses of the business.

The average business concern that extends credit to customers must advance its current running expenses until such time as the collections pay these costs. Cash is advanced today for the purpose of paying wages of clerks, for advertising, storage, truckage, etc. The business receives in exchange for these sums advanced, a book charge to customers (or a note) equal to the gross trading profit, which will be collected from the customer at some time in the future. The delay in the collection of these current expense items throws the burden of financing them on the owner of the business. He either adds the amount to his investment, or borrows the amount from the bank.

Hence, it is evident that since the overhead fund must be maintained at approximately the original figures and separately financed, that portion of accounts receivable outstanding, represented by the gross trading profit, must be eliminated in figuring the amount of incoming funds available for meeting payments on current indebtedness. In a going concern the current collections appear to pay current expenses and no financing of the gross trading profit figure seems to be necessary. However, a closer study will reveal the fact that such is not the case, and that there is a time element and an added finance element involved.

Expense Fund in Cash Business.—Where sales are made on a cash basis, the overhead fund revolves more rapidly, and collections of funds to meet expense items are made concurrently with the sale of merchandise. A shorter time exists between the date of the advance of expense money and its return through cash sales. Where credit sales are made, a longer time exists, and a larger fund is required for operating costs due to the compulsory waiting for the funds which the customers are holding.

Since gross profit in accounts receivable must be eliminated in determining a composite turnover of trading assets, it leaves for further consideration the two remaining funds mentioned above—receivables-at-cost and the inventory.

The Financing of Customer Credit.—The problem thus simplified resolves itself into a question of the relative rates of turnover of the receivables-at-cost plus merchandise inventory, compared with the turnover of the payables. The critical factor now to be considered is the added number of days' sales at cost which must be carried in the customers' accounts, with no additional credit extension from wholesalers and manufacturers.

Receivables and Merchandise Turn at Different Rates.—The fact that there exists a disparity in the rates of turnover and also a difference in the amounts of inventory and receivables-at-cost, respectively, does not necessarily mean that a composite turnover of the two funds cannot be determined. A closer scrutiny of the problem will reveal the fact that even though the rates may vary, there is a close correlation between them from a purely mathematical standpoint.

Since inventory-at-cost "turns" into receivables-at-cost, the speeding of the latter will speed the former; but, of course, not at the same rate. However, it must be noted that the same volume of sales at cost passes through both funds. The difference in the turnover *rates* is due to the difference in their relative sizes.

An added feature brought out by this study reveals the important fact that the cost of goods sold, if credit and inventory conditions are kept the same, is the same in amount as the "cost of goods" collected from customers; in other words, collections less gross trading profit equal the cost of sales.

Simplification is thus introduced into the problem by pointing out this similarity. Previously it was stated that in a cash business the per cent of assets which the creditors normally will carry is directly proportional to the number of days' credit granted by wholesalers, contrasted with the number of days required to turn cost of merchandise into cash, and inversely proportional to the rates of turnover of payables to the turnover of the inventory-at-cost.

Similarity Between Merchandise and Receivables.—The same rule can be applied in the case of credit sales and the carrying of receivables of a known turnover rate. Receivables-at-cost is simply another form of "inventory," and credit extension causes an increase in the total inventory of merchandise at cost figures. Whereas in a cash business a single inventory of merchandise was owned, now the firm has figuratively removed the goods to a second "warehouse," not necessarily the same size, called "trade debtors," and has refilled the first warehouse.

The same merchandise costs have passed through both warehouses. Since the gross profit in the trade debtors accounts must be deducted from the second warehouse to pay operating expenses as it is collected, the problem becomes one of determining the rate of flow of goods at cost through the two warehouses. Both inventories contain the same identical elements as a common denominator, namely, merchandise at cost. By merging the two funds into one large "warehouse" containing the two like elements, the rule becomes easy of application from a purely mathematical standpoint.

Composite Turnover of Merchandise and Receivables.—Three credit rules may be taken from these inventory-at-cost and receivables-at-cost turnovers. First, a "composite" turnover may be determined, meaning the number of days required to convert the two entire "inventories" into cash. The concept of the composite turnover follows the one used in accounting parlance where the turnover of working assets is contemplated and is found by comparing the average merchandise plus the average receivables with the total cost of sales per year.[4]

To secure the "composite" turnover of merchandise inventory-at-cost plus trade debtors-at-cost, divide the sum of the two into the cost of sales. The resultant gives the average length of time required to turn the two funds thus merged into

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[4] Under the old accounting rule of dividing sales by inventory-at-cost, and receivables (cost plus gross profit), a mathematically erroneous answer is derived because of the fact of the attempt to secure a ratio of unlike factors. Sales (which is cost plus gross profit) should not be contrasted with merchandise at cost. The answer would be an inflated turnover figure for the merchandise, an error which exists in business but should not be tolerated in scientific studies. Sales may be contrasted with receivables as both elements are homogeneous in the fact that both contain the cost of sales plus a mark-up. The answer would be a turnover of trade debtors per period, a correct mathematical figure, and a highly useful control factor. But to attempt to secure a true turnover by dividing sales (a cost plus a mark-up item) by a combination of two heterogeneous elements of inventory (a cost item) plus trade debtors (a cost plus a mark-up), is an impossibility.

the liquid form of cash. A cost of sales of $100,000 per year with a merchandise turnover of 4 turns per year, will give an average inventory of $25,000.

Sixty days' net credit to customers will result in 6 turns per year for trade debtors-at-cost, or an average amount outstanding of $16,667. The rate of turnover of the combined (cost) funds would be the cost of sales, $100,000, divided by $41,667, which gives the composite turn of 2.4 times per year, or once every 150 days, a period longer than the required length to turn either the merchandise or the receivables separately.

This is equivalent to saying that funds must pass through merchandise requiring 90 days, and secondly, through the receivables, requiring 60 days, or a total of 150 days for both. Since it requires 150 days to complete the cycle from merchandise to customers' accounts and back to cash, it follows that in the 60 days allowed by creditors, 60/150 of the cost value will have been collected from the two funds.

Overhead Fund Omitted.—Overhead is again omitted from the computation as this fund is not normally usable for paying trade creditors. At the end of the 60-day period extended by creditors, $16,667 will have been collected for current debt payment. Since the business is self-liquidating to the extent of $16,667, which is the sum collected in 60 days, all of the remaining current assets must be owned outright by proprietorship or secured by outside loans, if wholesale credit terms are fully observed. If the mark-up on sales is 33 1/3%, the average receivables would total $25,000 ($16,667 + $8,333) and the balance sheet would appear as follows:

BALANCE SHEET

Inventory	$25,000	Payables, 60 days	$16,667
Receivables-at-Cost	16,667	Proprietorship	33,333
Gross Trading Profit in Receivables	8,333		
	$50,000		$50,000

Why these rules are the same thing after all.

With a turnover of current assets of 2.4 and of current liabilities of 6 times per year, the same figure of creditor "load" or accounts payable is secured 2.4/6 × 41.667 = $16,667, with the same conclusion as to the required investment. The required liquidity ratio is three to one.

The Direct Rate of Turnover of Receivables and Payables.—The second rule states that creditors will carry that portion of the accounts receivables-at-cost which the inverse rate of turnover of payables bears to the rate of turnover of the receivables-at-cost, or, it may be found in the direct ratio of the number of days of credit extended by wholesalers to the number of days of credit extended to customers.

The sole source of cash receipts is from trade debtors, due to the fact that sales turn into credit claims. Creditors can be expected to carry that absolute amount of debt which the business itself can realize from collections-at-cost, during the period in which wholesale credit is extended. If in a given period of time these collections are not sufficient to extinguish the entire amount of indebtedness created to carry a given amount of assets, the owner must again supply the deficiency created by the slowness of the turnover of the assets carried by the business.

In the case above the total yearly collections of receivables-at-cost amount to $100,000 per year, $8,333 per month, or $16,667 in 60 days. Purchases will have been made at the same rate as the monthly cost of sales, thus creating new obligations ratably with the buying and the selling of goods. A perpetual inventory of $25,000 will be carried; receivables-at-cost will average $16,667; gross trading profit advanced will average $8,333, making a total of $50,000 in current assets. Since collections in 60 days amount to only 33 1/3% of the entire value of the assets, the remaining 66 2/3% must be invested by the owners or secured from outside loans.

The creditors, in this case, will carry a load equivalent to the amount of receivables-at-cost. This fact is due to the rate of turnover of receivables-at-cost of 6 times per year compared to a like turnover of payables. The investment of the owner will equal the merchandise and the expense fund, equal to the mark-up on the receivables, or a total of $33,333, as in the previous case developed by the composite rule.

The Turnover of Merchandise and Payables.—The third rule states that the creditors will carry that portion of the inventory which the rate of turnover of the payables bears to the rate of turnover of the inventory. By comparing the turnover of payables to the turnover of merchandise, naturally an identical result will be secured. Here the turnover of the merchandise simply furnishes a mathematical equivalent for the turnover of receivables because of the exact dependence of the rate of the former upon the latter. In the above illustration, the inventory of $25,000 turned 4 times per year, or once every 90 days, and payables turned once every 60 days, giving a direct ratio of the latter to the former of 2 to 3. If it requires 90 days to complete the turnover of the inventory and the payables complete their cycle in 60 days, it means that the values received from the revolution of the merchandise will pay only two-thirds of their own cost, or $16,667. This is the extreme amount available for debt payment in this given situation, and the owner must supply the balance, or $33,333. Only in cases where the rates of turnover of merchandise or receivables change will a different result be secured.

The Financing of Other Assets.—All other assets, such as cash, securities, prepaid insurance, and other similar items used in merchandising and the plant investment, must be added to the items carried by the owner.

If we let L equal the amount of credit (in dollars) which the business can carry, A equal the value of merchandise-at-cost plus receivables-at-cost, TW the composite rate of turnover of these two items, and tp the number of payables per period, then

$$L = A\left(\frac{TW}{tp}\right).$$

CHAPTER XIV

CONTROL OVER WORKING CAPITAL (CONTINUED)

Working Capital Rule Proved by Ledger Practice.—The general rule for proving the working capital requirements of a commercial concern can be proved by carrying a series of transactions through a system of ledger accounts. A concern with an average (perpetual) inventory of $75,000, which turns 3 times per year, or one turn every four months, all sales made on 60-day credit (an average turnover of 6 times for receivables per year), a gross trading profit of 33 1/3% on sales, and 90-day credit from wholesalers, would have a balance sheet as follows, according to the rule as developed in the preceding chapter:

BALANCE SHEET—X COMPANY

Inventory	$ 75,000✓	Accounts Payable	$ 56,250
Receivables-at-Cost	37,500✓	Net Worth	80,000
Gross Trading Profit in Receivables	18,750✓		
Miscellaneous Current Assets	5,000✓		
	$136,250		$136,250

A merchandise turnover of 3 times per year would give a cost of sales of $225,000. A mark-up on sales of 33 1/3% would result in a gross trading profit of $112,500, on a total sales of $337,500. With a credit extension to customers of 60 days net, the average outstanding receivables at any time, assuming a non-seasonal business, would amount to $56,250, divided into two portions: (1) receivables-at-cost of $37,500, and (2) gross trading profit in receivables of $18,750.

If the gross profit be required to cover operating expenses,

the composite turnover of the receivables-at-cost and the merchandise-at-cost would be twice per year ($225,000 ÷ $112,500). With a turnover of payables of 4 times per year (90-day credit), an inverse ratio of 2 to 4 is secured by comparing the payables rate to the asset rate, or, expressed in time, 90 days extended by wholesalers compared with 180 days required to turn the assets into cash. Creditors can safely carry an amount equal to one-half of the merchandise plus the cost-of-receivables, or $56,250. The balance of the inventory and receivables-at-cost; the gross trading profit on the receivables, $18,750; plus the miscellaneous assets, $5,000, or a total of $80,000, must be invested by the owner in order to carry such a business through an average year at the rates of turnover indicated. The ledger of such a concern will reflect the identical situation of the required investment in working capital, of accounts payable carried, of the size of the average inventory, receivables and miscellaneous assets.

NO. 1. MERCHANDISE ACCOUNT

Jan. 1	Purchases	$ 75,000	Mar. 30	Cost of Sales to Close	$ 56,250
Jan. 30	Purchases	18,750	30	Balance	75,000
Feb. 28	Purchases	18,750			
Mar. 30	Purchases	18,750			
		$131,250			$131,250
	Balance	$ 75,000			

NO. 2. ACCOUNTS PAYABLE ACCOUNT

Mar. 30	In full cash from collections	$ 18,750	Jan. 1	Purchases	$ 75,000
30	From Proprietor	56,250	30	Purchases	18,750
30	Balance	56,250	Feb. 28	Purchases	18,750
			Mar. 30	Purchases	18,750
		$131,250			$131,250
				Bal. Forward	$ 56,250

No. 3. Accounts Receivable

Jan. 30	Cost of Sales.....	$ 18,750	Mar. 30	Collections of Cost Jan. Sales.....	$ 18,750
30	Gross Profit.....	9,375	30	Collection of Gross Profit, Jan. Sales	9,375
Feb. 28	Cost of Sales.....	18,750		Bal. Forward....	56,250
28	Gross Profit.....	9,375			
Mar. 30	Cost of Sales.....	18,750			
30	Gross Profit.....	9,375			
		$ 84,375			$ 84,375
	Balance Forward.	$ 56,250			

No. 4. Sales Account

Mar. 30	To Profit & Loss Acct..........	$ 84,375	Jan. 30	Sales............	$ 28,125
			Feb. 28	Sales............	28,125
			Mar. 30	Sales............	28,125
		$ 84,375			$ 84,375

No. 5. Expense Account

Jan. 30	Charged to Customers........	$ 9,375	Mar. 30	Closed to Profit & Loss..........	$ 28,125
Feb. 28	Charged to Customers........	9,375			
Mar. 30	Charged to Customers........	9,375			
		$ 28,125			$ 28,125

No. 6. Cash Account

Jan. 1	From Proprietor..	$ 5,000	Jan. 30	Expenses paid by Proprietor.....	$ 9,375
30	From Proprietor for Expenses...	9,375	Feb. 28	Expenses paid by Proprietor.....	9,375
Feb. 28	From Proprietor for Expenses...	9,375	Mar. 30	Expenses paid from Collections....	9,375
Mar. 30	Collections from Customers.....	28,125	Mar. 30	Accounts Payable	18,750
			30	Balance.........	5,000
		$ 51,875			$ 51,875
	Bal. Forward....	$ 5,000			

No. 7. Profit and Loss Account

Mar. 30	Cost of Sales 3 months........	$ 56,250	Mar. 30	Sales 3 months...	$ 84,375
30	Expenses charged as Gross Profit to Customers...	28,125			
		$ 84,375			$ 84,375

No. 8. Net Worth Account

Mar. 30	Balance.........	$ 80,000	Jan. 1	Cash (Initial)....	$ 5,000
			30	Cash for Expenses	9,375
			Feb. 28	Cash for Expenses	9,375
			Mar. 30	Cash for Accounts Payable.......	56,250
		$ 80,000			$ 80,000

Trial Balance, March 30

1	Cash............	$ 5,000	1	Payables........	$ 56,250
2	Merchandise.....	75,000	2	Net Worth......	80,000
3	Receivables......	56,250			
		$136,250			$136,250

What the Ledger Accounts Show.—The important features which this ledger practice brings to our attention are two in number: first, the amount of the necessary working capital investment, and second, the date when this investment must be made in full by the owner. The simplest case is to assume that the full amount of purchases are made on credit at the beginning of a stated period, and that sales and purchases are made concurrently throughout the period, the purchases being of the same amount as the monthly cost of sales.

In the above case the ledger accounts show purchases (No. 1) of $75,000 on January 1 and at the rate of $18,750 monthly thereafter. The books are closed quarterly, in order to clear the account of the cost of sales, leaving a balance of inventory of $75,000. The quarterly date is not essential, as any time of closing will give the same results. Sales account (No. 4) is credited monthly with sales with a mark-up of 50% on costs. This account is closed into profit and loss to clear on March 30. Accounts receivable (No. 3) is charged monthly with cost of sales $18,750, and gross trading profit $9,375. Since the credit terms are 60 days net, the January sales of $28,125 will not be collected until March 30. Of this amount 33 1/3% ($9,375) is payable for expense payment, and the balance ($18,750) for payment on accounts payable. The balance of the accounts receivable will show (perpetually) $56,250. The accounts payable (No. 2) shows a credit of $75,000 January 1; $18,750 will be added for monthly purchases through March 30, giving a total indebtedness of $131,250 at the latter date. Since the terms are 60 days net, the full amount due at March 30, namely, $75,000 for the January 1 purchases, must be paid. Collections of the cost of sales from trade debtors ($18,750) for January sales are available for the purpose; however, this is the only sum which the business itself has for debt payment. The balance of $56,250 must be supplied by the owner. This is the critical factor brought out by the ledger study.

The fact that the case assumed represents purchases of the entire inventory *de novo*, does not change the fundamental principle emphasized previously that proprietorship must make up any deficiency to creditors not supplied from collections.

The full inventory load of $75,000 must be carried by the business. If only 25% is collected at the due date of the first invoice, 75% of the merchandise is the required contribution of the owner. In this case the collections at cost during April and every month thereafter are equal to the maturing obligations which were contracted during the period 60 days previous. April collections will pay for February purchases; May for March, and so on indefinitely unless the purchase program be curtailed through a reduction of the inventory. If a greater

merchandise load is carried, a smaller proportion of collections will be secured from customers, compared to the total new inventory, which is the reason why an added investment (or bank loan) is necessary.

The expense account (No. 5), debited with $9,375 per month, is the same figure charged as gross trading profit to customers. It represents an investment by the owner of 60 days' and 30 days' expense money collected from customers during the third month. The expense fund, which must be carried perpetually by the firm here, is equivalent, it will be noted, to two months' gross trading profit. During the first 60 days no collections are made from customers; hence, the proprietor must invest the overhead fund during this time.

The cash receipts (No. 6) are: January 1, $5,000 for miscellaneous purposes permanently invested by the owner; January 30, $9,375 for January expenses invested during the month by the proprietor as needed; February 28, $9,375 from the same source and for the same purpose; March 30, $28,125 collections from customers during the month, $9,375 of which is available for March expenses, paid out during the month, and $18,750 for debt payment on the maturing obligations.

The profit and loss account (No. 7) reflects the trading position which shows no profit earned and features the exact mathematical correlation of the amount of monthly cash expenses and the charge of the gross trading profit margin to customers.

The net worth (No. 8) shows the dates and amounts of necessary cash contributions of the proprietor. The expense payments would be made currently throughout the period in a going concern. The $56,250 would be made in a series of payments, at dates approximating the 60-day intervals from the first date of purchase.

If the ledger were continued indefinitely after March 30, on the same mathematical basis of turnovers, the identical relationships of purchases, collections, expenses and payments on account would persist. The proprietor's contribution will always be reflected in the deficiency of three accounts: (1) the miscellaneous item, which is normally represented by cash and prepaid expenses; (2) the operating expenses required to carry the business until the collections "catch up" and pay this cost; and (3) the shortage in the payables account, which, if paid in, will liquidate all outstanding indebtedness for goods bought. If no credits are carried to the proprietor's account at any time, let us say for a full year, the excess credits in the cash account representing the necessary outlay will reflect the mathematical shortage which the owner should have made, and it holds for all cases, regardless of the rates of turnover or the length of credits granted to customers or granted by wholesalers.

Budget of Purchases, Sales and Collections.—A budget plan showing seasonal purchases, sales, and collections, is presented in Figure 18. The general plan used in budgeting seasonal business is the same as that followed in the ledger practice, shown earlier in the chapter.

Month	Purchases	Cost of Sales	Added to Inventory	Sales		Collections	Balance Receivables
				Gross Profit	Rec. at Cost		
Jan. 1	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
Jan. 30	0	0	0	0	0	0	0
Feb. 28	6,250	0	6,250	0	0	0	0
Mar. 30	12,500	6,250	12,500	3,125	6,250	0	9,375
Apr. 30	8,750	12,500	8,750	6,250	12,500	0	28,125
May 30	3,750	8,750	3,750	4,375	8,750	0	41,250
June 30	0	3,750	0	1,875	3,750	9,375	37,500
July 30	0	0	0	0	0	18,750	18,750
Aug. 30	5,000	0	5,000	0	0	13,125	5,625
Sep. 30	15,000	5,000	15,000	2,500	5,000	5,625	7,500
Oct. 30	16,250	15,000	16,250	7,500	15,000	0	30,000
Nov. 30	8,750	16,250	8,750	8,125	16,250	0	54,375
Dec. 30	0	8,750	0	4,375	8,750	7,500	60,000
Jan. 30	0	0	0	0	0	22,500	37,500
Feb. 28	6,250	0	6,250	0	0	24,375	13,125
Mar. 30	12,500	6,250	12,500	3,125	6,250	13,125	9,375
Apr. 30	8,750	12,500	8,750	6,250	12,500	0	28,125
May 30	3,750	8,750	3,750	4,375	8,750	0	41,250

Figure 18. Budget of Seasonal Purchases, Sales, and Collections

Use of Bank Loans.—At this juncture it might be well to consider the question of bank loans as they apply to the larger problem of required investment in working assets. It is obvious to business men and bankers alike, that the line of credit which a merchant can successfully carry will vary, not according to a mathematical formula which might obtain in any given business situation, but in line with the general ability of the applicant, and more particularly with regard to his success in making profits, consistently one year with another. Hence it is impossible to make a generalization regarding bank credit because of the many varied conditions under which loans are made.

However, within certain business conditions as governed by the stock turnover, volume of sales and the owner's investment, a generalization may be made apropos of the mathematical limits of short-term loans.

Bank Credit.—It is a self-evident fact that any business concern, if it has a proper investment of capital, can carry a line of general credit of a size such that each turnover cycle of working assets will clear the maturing debt created to carry the self-same amount of assets. It is just as obvious that the same business can safely borrow an amount at the bank which it can always repay in full, at the time stated in the loan contract.

If receipts are insufficient to cover the loan at maturity, one of three things usually will happen: (1) the loan is renewed and the banker becomes, temporarily at least, an investor in the business; (2) the inventory is reduced or the accounts receivable cut down by better collection or through the shortening of the credit terms; (3) the general creditors are held up in their payments until the bank loan has been liquidated.

Under the latter circumstances the creditors assume the rôle of investors in the business.

In a non-seasonal business, where the collections (at cost) are sufficient to cover the maturing current debts, no additional sums are available for repaying bank loans so long as a constant inventory is kept and receivables are not reduced as outlined above. If the merchant, under these rather simple conditions, has failed to invest a sufficient amount to make his business "self-liquidating," and borrows from the bank to cover his deficient capital (called a proprietory or capital loan), the banker is permanently in the position of a part owner, especially if the profits are withdrawn as earned.

Reinvested Profits and Bank Loans.—Profits reinvested in the business are available for repayment of bank loans, and if bank loans have been made for carrying a part of the "proprietory" investment, other conditions pertaining to the current assets remaining the same, it follows that the loan can be repaid only out of profits as earned and reinvested if the normal assets are carried. There will be no other source of funds for the liquidation of such loans. If all collections are required to liquidate the payables as the latter fall due, from what source may funds be secured with which to repay the notes?

Seasonal Financing.—The mistake should not be made of assuming that this generalization applies to seasonal financing or to the working capital requirements of a concern, the sales of which are of pronounced irregularity throughout the year. The formula for working capital requirements as here developed gives emphasis to the undesirableness of making so-called capital loans, and of the necessity of limiting credit to merchants for seasonal requirements. It is an unwritten law among many bankers to refrain from making capital loans even to successful concerns, and practically to refuse them outright where the applicant is starting in a new field of business, where the concern has not proved its ability to carry its capital requirements.

Capital Loans.—The true function of commercial banks is to supply temporary funds to commercial firms in order that the latter may bridge the period of time required to convert its added inventory load into cash. It is not contemplated that commercial banks should carry the capital load by remaining a permanent investor in any concern.

The proof of a liquid condition and a balanced ratio between inside and outside equities in working assets, is found in the ability of a borrower to pay off completely his bank loans at least once a year. Failure completely to liquidate his loans on this basis is indicative of an insufficient working capital. Failure to turn completely the inventory and the receivables into cash, indicates lack of cooperation on the part of the purchasing and credit departments, respectively.

All creditors, including bankers, inevitably become "partners" if their credits are continually in use in carrying a financial load that rightfully belongs to the owners. The creditors not only finance the "peak" load of the seasonal requirements but also the off-season load; hence they are subject to the full hazards of the business. If the axiom of the commercial banker regarding non-capital loans is correct, then it follows that all money required to carry a business for the off-season requirements should be supplied from investment sources. If a part of this fund is supplied at normal commercial rates, the bankers and creditors as well are unknowingly taking a capital risk, with none of the compensating factors of participation in management, or securing a return of sufficient amount to equalize the risk involved.

If in the initial financing of a business, or in its subsequent growth, the fundamental structure is such that at the low point in seasonal activity, the demand for funds is greater than the permanent investment in the working capital as supplied

Date	Purchases	Accounts Payable Cr.	Payment on Account	Bal. of Accounts Payable	Collections Rec. (1)	Expenses (Gross Profit) (3)	Bank Loans (Cr.)	Repayment Bank Loans	Balance Bank Loans
Jan. 1	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
Jan. 30	0	0	0	0	0	0	0	0	0
Feb. 28	6,250	6,250	0	6,250	0	0	0	0	0
Mar. 30	12,500	12,500	0	18,750	0	3,125 (6)	3,125 (4)	0	3,125
Apr. 30	8,750	8,750	6,250 (5)	21,250	0	6,250 (6)	6,250 (4) 6,250 (5)	0	15,625
May 30	3,750	3,750	12,500 (5)	12,500	0	4,375 (6)	4,375 (4) 12,500 (5)	0	32,500
June 30	0	0	7,500 (7)	5,000	9,375	1,875 (7)	0	0	32,500
July 30	0	0	5,000 (7)	0	18,750	0	0	13,750 (2)	18,750
Aug. 30	5,000	5,000	0	5,000	13,125	0	0	13,125 (7)	5,625
Sep. 30	15,000	15,000	0	20,000	5,625	2,500 (7)	0	3,125 (2)	2,500
Oct. 30	16,250	16,250	5,000 (6)	31,250	0	7,500 (6)	7,500 (4) 5,000 (5)	0	15,000
Nov. 30	8,750	8,750	15,000 (6)	25,000	0	8,125 (6)	8,125 (4) 15,000 (5)	0	38,125
Dec. 30	0	0	13,125 (6) 3,125 (7)	8,750	7,500	4,375	13,125 (5)	0	51,250
Jan. 30	0	0	8,750 (7)	0	22,500	0	0	13,750 (7)	37,500
Feb. 28	6,250	6,250	0	6,250	24,375	0	0	24,375 (7)	13,125
Mar. 30	12,500	12,500	0	18,750	13,125	3,125	0	10,000 (2)	3,125
Apr. 30	8,750	8,750	6,250 (5)	21,250	0	6,250	6,250 (4) 6,250 (5)	0	15,625
May 30	3,750	3,750	12,500 (5)	12,500	0	4,375	4,375 (4) 12,500 (5)	0	32,500

(1) See Figure 18 for collection program. (2) Funds available for repayment after expenses. (3) Expenses at same rate as gross profit. (4) Bank loans made to carry expenses for month. (5) Bank loans made for paying accounts payable. (6) Borrowed from bank. (7) Collections from customers.

Figure 19. Budget of Seasonal Purchases, Accounts Payable and Bank Loans

through the flotation of long-term securities, the reinvestment of profits, and the reinvestment of various types of reserves, it is necessary that the net worth be increased to the point where it will approximate the capital requirements, as indicated by the budgetary plan brought out through the working out of the rule, developed earlier in the chapter.

Credit Limits for Bank Loans.—If the owner has made a sufficient investment to carry the current assets through the normal season, and if bank loans are limited to seasonal requirements, the problem of working capital requirements for a seasonal business consists of two parts: (1) the calculation of the capital outlay needed for the off-peak months, which would be that required for the entire year; and (2) the budgeting of purchases and expenses and the required bank loans needed to carry the peak load. In short, the seasonal financing is superimposed upon the normal financing, and as such can be handled as a separate problem.

If the "seasonal" business is done on substantially the same general credit conditions as the off-peak business, the budget of bank loans can be planned by taking into account the amount of the added monthly purchases and expenses, together with the time required to convert the same items into means of payment. The bank loans function in this case in the same way as the investment of the owner. The seasonal business usually is self-liquidating in the same way and to about the same extent as the normal business. If it requires 180 days from date of invoice to the date of collections to turn a line of seasonal goods and the wholesaler must be paid at the end of 90 days, a budget plan can be worked out showing the seasonal loan requirements, and the percentage of the new business which can safely be carried on wholesale credit as compared with bank loans. (See Figure 19.)

CHAPTER XV

CONTROL OVER OPERATIONS—PROFIT AND LOSS STATEMENTS

Control Function of Operating Statements.—A noteworthy measure of control may be exercised over operating efficiency through the use of the profit and loss and manufacturing statements that feature the final results of the buying, processing, selling, administrative, and financial activities of a business for a given period. If properly drawn up and analyzed, these statements may be used in a dual capacity, first, as a means of internal analysis and control, and second, as supplementary credit information used by credit men and bankers.

The ordinary profit and loss statement has been used for a considerable period of time as the chief means for detecting causes for departmental losses or gains within a business. It is only of late years that these statements have been supplemented to any great extent by statistical data and budget reports. As a system of control used in conjunction with the usual budgetary system, the analyzed manufacturing and profit and loss statements add critical information that is indispensable for the correlating of all the data that directly record merchandising and financial facts.

While the budget report tells management what should happen in terms of volume of business, purchases, manufacturing costs, departmental expenses, etc., and also what has happened to each unit of activity in the business, it is the function of the operating statements to tell the completed story of the business as a whole as distinguished from a fragmentary story of standard estimates and performance as given by the budget reports.

These statements furnish a starting point for a more detailed analysis of the physical plant conditions that are directly responsible for faulty performance as reflected in the statements, and while the use of budgets gives a reliable check over sales, purchases, materials, labor and manufacturing expense and departmental expense quotas, and also affords an index of the efficiency and departmental performance, there is need for a general report that assembles all these data and measures the specific productivity of each integral part of the business.

In any business concern one of the most important things that management will require is an effective device that will correlate all the activities of the business and show the effectiveness of the control, not over the separate operating departments as isolated parts, but over the entire business as a going concern.

In the last analysis the success of any departmental officer can be measured in terms of his specific contribution to financial progress, either in income earned or expense saved.

Profit and Loss Statement.—It is the primary purpose of the operating statements to control all of the elements that enter directly into the making of net profits. In simple form an

A. B. C. COMPANY
PROFIT AND LOSS STATEMENT

			%
Sales for Year		$575,000	100.00
Cost of Goods Sold		483,000	84.00
Gross Trading Profit		$ 92,000	16.00
Selling Expenses	$28,750		5.00
Administrative Expenses	23,000		4.00
Financial Expenses	11,500		2.00
Total Expenses		63,250	11.00
Net Trading Profit		$ 28,750	5.00
Profit Sale Securities	5,000		
Less Loss Sale Real Estate	4,000		
Net Extraneous Gain		1,000	
Net Profit for Period		$ 29,750	5.2

operating statement shows total income received from all sources, from which are deducted the trading, financial, and miscellaneous costs and expenses incidental to the procuring of the revenue. A typical profit and loss statement is shown on the preceding page.

Reduced to the lowest terms a profit and loss statement may be said to consist of five features:

1. Principal or Operating Income
2. Principal or Operating Costs and Expenses
3. Principal or Operating Profit
4. Outside Income and Expenses
5. Net Profit or Surplus for Period

The above statement shows that from the total principal income on sales amounting to $575,000, there was deducted the costs of sales $483,000, and expenses of $63,250 which left an operating profit of $28,750, or 5% of the total sales. The outside income, or the minor activities of the business, returned an additional $1,000, thus making a total net profit of $29,750, or 5.2% on sales. The extraneous income and expense items "were annexed" to the profit and loss statement and not reported directly in the surplus statement, as these outside activities were a part of the economic factors that caused a change in the financial status of the business. As the operating statement should reflect all the dynamic factors that cause changes in the financial position, it should include all extraneous items, even though they are merely incidental to the major activity of the business, which is the buying, processing, and selling of merchandise. Considered from another viewpoint the operating statement reflects a twofold classification of business data:

I. Economic Income	II. Economic Outgo or Costs
(a) Major Activities	(a) Major Activities
(b) Minor Activities	(b) Minor Activities

III. Net Economic Gain or Loss

Thus considered, the profit and loss statement shows the allotment of the proceeds received from sales. The costs represent the part expended and paid to outsiders to secure the net surplus which is the only portion remaining in the firm to permanently increase its resources.

Relationship Between Profit and Loss Statement and Balance Sheet.—The net gain or loss is the only economic fac-

FIRST BALANCE SHEET

Current Assets	$250,000
Fixed Assets	400,000
	$650,000
Current Liabilities	$125,000
Fixed Liabilities	200,000
Capital Stock	200,000
Surplus	125,000
	$650,000

PROFIT AND LOSS STATEMENT

Sales	$900,000
Cost of Sales	700,000
Gross Profit	$200,000
Expenses	100,000
To Surplus	$100,000

SECOND BALANCE SHEET

Current Assets	$275,000
Fixed Assets	425,000
	$700,000
Current Liabilities	$100,000
Fixed Liabilities	175,000
Capital Stock	200,000
Surplus	125,000
Net Gain	100,000
	$700,000

tor that can change the surplus appearing in the balance sheet; any alteration in this account not found in the income statement should be investigated to ascertain if the change has been brought about by legitimate bookkeeping adjustments or has come from a manipulation of the accounts. In a normal case the only major changes in the surplus accounts come through profits or losses as shown by the statements above.

Had the second balance sheet shown a greater surplus than $225,000, it would have been the result of a false inflation of assets or a false decrease in liabilities. If a full operating loss is not reflected in the surplus account after closing, the conclusion may be drawn again, that the accounts have been manipulated.

Standard Statement Forms.—If properly constructed the income statements should reflect the essential functional activities of the business covered in the report. No single form is adaptable to all concerns even though they be engaged in similar business fields, such as manufacturing, merchandising, amusement, transportation, etc. Since the prime function of a financial statement is control, it should feature those elements that are the object of control effort, and normally should reflect the activities of the major functional officers to whom operational duties have been delegated.

The showing of departmental responsibility should not be sacrificed to form. If required for external use, say, credit purposes, a standard form may be used and the data rearranged to fit such a need. However, the internal purpose should ordinarily be considered of prime importance. There is a growing tendency in the business world toward standardization of external reports.

Profit and Loss Standards.—A more searching analysis will reveal that the net profit above is the result of four variables, viz., (1) sale price of goods sold, (2) physical volume

of goods sold, (3) the unit cost of the goods sold, and (4) the fixed and variable expenses utilized in conducting operations. All four factors are mutually interdependent; and in order to show a net profit, they must bear a definite relationship to each other. No one factor may change absolutely without resulting in a direct variation in the per cent of all remaining items to that factor, even though they remain constant in amount. Sales expenses, for example, may be 10% of a sales volume for one year, but if the sales prices of the goods are changed, or if the volume of trade is altered, the per cent of expenses to sales totals will become out of line, and a direct variation in net profits will result. The same is true of the other factors of expense in their relationship to sales.

REX BAKING COMPANY

1926–1927

	1925	1926	Increase or Decrease* from 1926	
			Amount	%
Gross Sales	$241,718.00	$261,817.00	$20,099.00	8.31
Less Sales Returns and Allowances	1,876.00	2,178.00	302.00	16.09
Net Sales	239,842.00	259,639.00	19,797.00	8.25
Less Cost of Goods Sold	197,567.30	202,943.15	5,375.85	2.72
Gross Profit on Sales	42,274.70	56,695.85	14,421.15	34.11
Less Selling Expenses	24,655.70	25,622.10	966.40	3.92
Net Profit on Sales	17,619.00	31,073.75	13,454.75	76.36
Less General and Administrative Expenses	12,938.00	13,439.90	501.90	3.88
Net Profit on Operations	4,681.00	17,633.85	12,952.85	276.71
Less Net Financial Expense	8,632.00	5,939.00	*2,693.00	31.19*
	**3,951.00	11,694.85	15,645.85	
Fire Loss	1,200.00		*1,200.00	100.00*
Net Profit or Loss** for Year	$**5,151.00	$ 11,694.85	$16,845.85	327.04

Figure 20. Comparative Profit and Loss Statement, Showing Variations in Amounts and Per Cents

The important questions raised from a control standpoint, if a change in the items has occurred between periods, are: (1) what factor or group of factors have become out of line in relation to the other factors; (2) the causes for the change; (3) what factor or group of factors have improved relative to the other factors; (4) the causes for the changed position.

For example, in the analyzed comparative profit and loss statements of the Rex Baking Company (Figures 20, 21, and 22) which show changes in amounts and per cents of the various items of income and expenses, the important problems that

Rex Baking Company

1926–1927

	1925		1926		Increase or Decrease* in Rates from 1926 %
	Amount	% of Sales	Amount	% of Net Sales	
Gross Sales	$241,718.00	100.78	$261,817.00	100.84	0.06
Less Sales Returns and Allowances	1,876.00	0.78	2,178.00	0.84	0.06
Net Sales	239,842.00	100.00	259,639.00	100.00	
Less Cost of Goods Sold	197,567.30	82.37	202,943.15	78.16	4.21*
Gross Profit on Sales	42,274.70	17.63	56,695.85	21.83	4.20
Less Selling Expenses	24,655.70	10.28	25,622.10	9.87	0.41*
Net Profit on Sales	17,619.00	7.35	31,073.75	11.97	4.62
Less General and Administrative Expenses	12,938.00	5.39	13,439.90	5.17	0.22*
Net Profit on Operations	4,681.00	1.95	17,633.85	6.79	4.84
Less Net Financial Expenses	8,632.00	3.60	5,939.00	2.28	1.32*
	3,951.00	1.65	11,694.85	4.50	6.15
Fire Loss	1,200.00	0.50			0.50*
Net Profit or Loss** for Year	$**5,151.00	2.15	$ 11,694.85	4.50	6.65

Figure 21. Condensed Profit and Loss Statement, Showing Per Cent of Each Item to Net Sales and Increase or Decrease in Per Cents

present themselves to the management are these: (1) which of the cost items is out of line or in need of special investigation; (2) which items are in line and need no further research; (3) which items show improvement and call for encouragement.

Profit and Loss Statistics.—The usual profit and loss summary illustrated by Figures 20 and 21, without efficiency standards fails to reveal whether the work of the functional officers for the period is up to par or is something less than par. Without the use of some reliable measuring device it cannot be determined whether the gross profit margin is correct; whether the individual selling expenses (see Figure 22), the administrative expenses, or the financial expenses and income are subject to censure or to commendation.

Trade statistics of similar operating or selling plants in some cases can be projected into a given plant and used for measuring purposes to determine which of the factors are out of line. But exact similarity of plants is rare and still more rare is similarity between a given plant and an "average" plant postulated from "average" statistics. In most instances the

Rex Baking Company

1926–1927

Selling Expenses

	1925	1926	Increase or Decrease* from 1926	
			Amount	%
Taxes	$ 117.50	$ 178.60	$ 61.10	52.00
Insurance	124.20	117.50	6.70*	5.39*
Advertising	6,382.00	6,084.00	298.00*	4.67*
Salesmen's Salaries	10,200.00	11,340.00	1,140.00	11.17
Salesmen's Traveling Expenses	6,842.00	6,943.00	101.00	1.47
Miscellaneous Selling Expenses	990.00	959.00	31.00*	3.13*
Total	$24,655.70	$25,622.10	$ 966.40	3.92

Figure 22. (See following page)

General Expenses

	1925	1926	Increase or Decrease* from 1926	
			Amount	%
Office Salaries	$ 4,850.00	$ 4,956.00	$106.00	2.18
Officers' Salaries	6,500.00	6,500.00		
Stationery and Printing	628.00	702.00	74.00	11.78
Office Supplies	210.00	298.00	88.00	41.90
Telephone and Telegraph	126.00	218.00	92.00	73.01
Miscellaneous General Expense	310.00	391.00	81.00	26.13
Depreciation on Office Equipment	314.00	374.90	60.90	19.39
Total	$12,938.00	$13,439.90	$501.90	3.88

Financial Expense and Income

	1925	1926	Increase or Decrease* from 1926	
			Amount	%
Financial Expense:				
Interest on Bonds	$5,900.00	$4,550.00	$1,350.00*	22.88*
Interest on Notes Payable	881.00	1,151.00	270.00	30.64
Discount on Sales	2,090.00	1,876.00	214.00*	10.24*
Loss on Bad Debts	865.00	1,122.00	257.00	29.71
	9,736.00	8,699.00	1,037.00*	10.65*
Financial Income:				
Interest on Notes Receivable	399.00	773.00	374.00	93.73
Discount on Purchases	305.00	1,077.00	772.00	253.11
Dividends on La France Stock	400.00		400.00*	100.00*
Interest on Bonds		910.00	910.00	100.00
	1,104.00	2,760.00	1,656.00	150.00
Net Financial Expense	$8,632.00	$5,939.00	$2,693.00*	31.20*

Figure 22. Showing Schedules of Comparative Selling (See preceding page), General, and Financial Expenses and Income

most trustworthy standards are those evolved from the experience of the plant which it is desired to control.

The Budget a Standard.—A fast developing standard technique which is coming into greater use as a standard for

the predetermining of operations is the operating and financial budget, a standard which is consolidated from the best past performance and which is projected into the future as a measure of, and a motive for, anticipated improvement. A budget is a continuing and progressive standard used in support of the operating statements—continuing in the sense that it coincides with current operations and furnishes an ever present standard usable at any time; progressive in the sense that it may be currently revised to reflect present changes in physical conditions in the plant. A comparison between anticipated budgetary performance and the actual performance in the profit and loss statement will reveal in summarized form how efficiently operated are the economic elements of the business.

Plan Where No Budget Is Employed.—For the concern that does not operate under a budget system but uses its past operating statements for determining current tendencies, the use of a comparative profit and loss statement serves a useful function in diagnosing good or bad trends, and may be used as a point of departure for analyzing faulty conditions within the various departments. The primary purpose of budgetary control is that of supplying current information covering expenditures measured against a predetermined budget standard. Current profit and loss statements give information regarding the actual income and outgo items and show the effect of all activities that go into the making of net profits.

To be of the greatest value, these comparative statements should be issued frequently, monthly or weekly if possible or at any interval consistent with the cost incidental to their preparation. The value of any statistical or accounting control device depends largely upon its "up-to-dateness." Post mortem reports, whether in the form of budgetary follow-up statements or the ordinary profit and loss and balance sheet statements and secondary statistical reports, are of limited value for controlling current conditions.

Cause for Variation in Profits.—Quite apart from the problem of checking anticipated budgeted performance with actual performance, there is need for a study of the immediate causes for the variation in net profits from one year to the next, or from one month to the next. General trends in operating conditions can be determined if the present performance can be checked against the performance for the last period, or the current period contrasted with the same period a year ago, etc.

But before attempting to identify the causes for the variation in net profits from a given point, it will be necessary to analyze the factors that contribute to profit change and to indicate the responsibilities of the functional officers of the business for such changes as are found.

Specific Contributions of Functional Officers.—The various contributions made by functional officers to changes in net profits from period to period may be grouped under the following headings:

First, the contribution made by the sales manager who is charged with the responsibility of (a) the securing of sales volume, (b) the budgeting and expenditure of selling expenses, and (c) the pricing of goods.

Second, the contribution made by the buyer, who is charged with the responsibility of (a) purchasing the required goods on an economical basis, and (b) budgeting and expenditure of buying expense funds.

Third, the contribution made by the superintendent of production, who is charged with the economical production of goods where they are produced and not purchased.

Fourth, the contribution of the general manager, or comptroller,[1] who is charged with the responsibility of the budgeting and expenditure of general administrative expense funds.

Fifth, the contribution of the finance manager, who is charged with the responsibility of, (a) the budgeting and expenditure of capital outlay and operating financial funds, (b) handling of credits and collections, and (c) employment of idle funds and securities.

A system of reports, then, is necessary to detect whether the progressive strength of the operating conditions lies in (1) control over volume of sales, (2) control over the buying costs, (3) control over manufacturing costs and expenses, (4) control over selling, general overhead, and financial expenses, (5) control over changing prices, or (6) a combination of these factors.

Before entering into a discussion of the mathematical technique for checking performance, it is well to point out the fact that not all of the unfavorable financial tendencies can be directly charged to the responsible officer whose activities are under inspection, nor can all the favorable tendencies be credited to such a person. The report is an indicator of operating and financial trends of departmental efficiency, and furnishes a starting point for a more intensive study for detailed control. It should be used with departmental budgets and cost reports.

The Sales Manager's Contribution to Net Profits.—The primary function of the sales manager is the procuring and holding of sales volume. In securing new business, he is usually held to full accountability. However, in creating and holding goodwill, he must be assisted by all other departmental heads who deal directly and indirectly with the public. The advertising, service, personnel, credits and collection departments, all render an important part in holding sales volume acquired by the sales department; also the production department, if the goods be manufactured for sale, and the buying department are charged with holding customer goodwill through the maintenance of quality of goods. While the sales manager may be charged with the decline in net profits occasioned by declining volume and given credit for increasing volume,

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[1] A report covering a combination of the above functional departments may be made according to the general plan of the organization of a particular plant.

nevertheless other functional officers must share a part of the responsibility with the sales manager in this field.

In constructing standards for measuring the efficiency of the sales department, it must be remembered that, by the nature of the case, there is a divided responsibility between all the functional officers who assist directly and indirectly in sales work. In the reports that are given here, the entire sales responsibility is assumed to be borne by the sales department. A more extensive investigation than is possible here will be needed to reveal whether the sales manager can be held to direct accountability or whether some of the factors are beyond his control and the responsibility for them shared by others.

Gross Profit Factors.—The starting point in checking the productivity of the sales department as a whole is the gross profit figure realized on goods sold. The size of the gross margin and the amount of the "trading" profit where the operating expenses are under control, becomes the critical factor in the ultimate amount of the net profit, for it is a well-known fact that all gross profits made over the expenses are reflected directly in the net gain for the year. The size of the gross figures in turn depends upon (1) the physical volume of goods sold, (2) their selling prices, and (3) their cost. If any one of these three factors changes from one year to another, the gross profit will change in direct proportion. Hence, the problem of control consists of more than a check upon the mere percentage of mark-up, or the pricing of the goods in the price lists and on price tags.

A tendency toward a declining amount of gross trading per cent is an undesirable condition, unless there is an unmistakable counter-tendency toward a greater volume of business sufficient in size to overcome the declining gross profit. Where the amount tends to narrow, there should be a detailed analysis made to learn the effective cause for the change and the remedy.

There are a score or more of conditions of changing volume, prices, and cost of sales that affect the gross profit, a few of which are taken here for illustrative purposes. All are conditions common to merchandising concerns and operate daily.[2]

Profits or Losses Caused by Changing Sales Volume.—The question of the identification of net profit or loss changes resulting from changes in volume of sales has been debated at length by accountants and statisticians. One viewpoint holds that no specific net productivity attaches to the new volume of business as such, and that no identification can be made between an added amount of sales and the change in net profit, because the net gain is the resultant of all the factors involved, such as volume, changes in sales prices, cost changes, and expense changes. No logical claim can be made, it is said, by any one of these factors to the net profit or loss, which is anonymous so far as specific productivity is concerned.

But if all of the separate cost and expense factors can be first isolated and then given a significant weighing, and if all price changes as they affect total sales can be isolated and identified, a definite and causal relationship can be established between the new volume added or dropped and the change in the net profit resulting therefrom. From a mathematical point of view an identification can be made between an increase or decrease in volume of sales, and the net profits derived from these sales in one year compared with another, or compared with a standard year's business which is accepted as a norm.

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[2] These combinations may be mentioned briefly in passing. They are: (1) constant; (2) increasing; or (3) decreasing physical volume accompanied in each case by (a) constant prices and constant costs; (b) rising prices and constant costs; (c) falling prices and constant costs; (d) constant prices and rising costs; (e) constant prices and declining costs; (f) rising prices and declining costs; (g) falling prices and rising costs. Then again, there are changing and constant volume factors that accompany rising prices and rising costs where the rise in costs may be at the same rate of increase as prices, faster than prices or slower than prices. Finally, there may be changing or constant physical volume accompanied by falling prices and falling costs where the fall in costs may be at the same rate as prices, faster than prices, or slower than prices. The total of these combinations number thirty-nine.

The Case Illustrated.—Let us take a concrete case. If the volume of sales of a given concern for 1926 amounted to $500,000, on which a gross profit of 20% and a net profit of 5% had been made, and if the increased volume for 1927 amounted to $100,000, making a total of $600,000 for the year, it may be assumed that if the price policy remains unchanged and the departmental expenses are maintained proportional to sales on the 1926 basis, the newly acquired sales volume will render to the firm the same gross profit per cent and the same net profit per cent as obtained on the previous year's business. The same rate will be made on the new volume as was earned on the old.

Likewise, if the volume recedes, if the same price policy holds, and the expense budget be reduced to the same per cent on sales, the gross trading profit and net trading profit lost would amount to the same figures on the reduced sales volume. One may question whether the assumption of "other factors remaining constant" is valid for control purposes. As long as the other factors, such as the correlation of the expenses required to procure the added volume, are fully analyzed and given due weight, the method of attack has logical justification as a process of deduction. If the only changing factor is sales volume, logically at least, since all other elements are unchanged, the dynamic factor of increase or decrease in sales is responsible for the change in the net results. For example, reduced to the form on the following page, the gross profit shows an increase from $100,000 to $120,000, or 20% on the added volume of $100,000; the net profit increased from $25,000 to $30,000, or 5% net on the added volume.

The other factors remained constant in their relationship to sales. In short, if we take the 1926 statement as a standard, and if this standard is used as a check on the 1927 performance, a ready means is given for comparing the new element of volume that enters into the change in the final resultant, namely, net profits. Volume is the only factor that has changed.

	1926	%	1927	%
Sales	$500,000	100	$600,000	100
Cost of Sales	400,000	80	480,000	80
Gross Profit	100,000	20	120,000	20
Expenses	75,000	15	90,000	15
Net Profit	$ 25,000	5	$ 30,000	5

Profits or Losses Derived from Changes in Selling Prices.—The effect on net profits of an increase or a decrease in prices of goods sold can also be measured separately from changes in the sales volume. When goods are priced higher one year compared with another, the total sales will, of course be increased, assuming the same number of units are sold each year. If 1,000 units are sold one year at $10 per unit and at $11 per unit the second year, the total sales will increase from $10,000 to $11,000. However, the physical volume has remained the same in both years.

Increased Prices.—If in 1927 using the same case, the physical volume of sales and the total expenses remained the same as in 1926, but if the price of the finished goods were raised to the point that the profit margin increased from 20% to 30% on sales, the following comparative statement would show:

	1926	%	1927	%
Sales	$500,000	100	$571,428	100
Cost of Sales	400,000	80	400,000	70
Gross Profit	100,000	20	171,428	30
Expenses	75,000	15	75,000	13.1
Net Profit	$ 25,000	5	$ 96,428	16.9

Here the only change was the increase in the price which resulted in an increase in sales from $500,000 to $571,428. Since the expenses remained the same in dollars and bore the same relationship to cost of sales as formerly, the increase in prices resulted in an increase in the net profit of $71,428; a case of an identification of a price change in the profit change.

Decreased Prices.—If selling prices in this same case had been reduced instead of being raised, so that the gross profit on sales fell to 15% on sales, with the same physical volume, the 1927 statement would read as follows:

	1927	%
Sales	$470,588	100.00
Cost of Sales	400,000	85.00
Gross Profit	70,588	15.00
Expenses	75,000	15.94
Net Loss	$ 4,412	0.94

The total net profit reduction of $29,412 from the 1926 year was the direct result of a price reduction. It was reflected here in the decreased sales. The identification of price change and profit change was based upon the fact that the unit cost of goods sold and the proportion of expenses to cost of sales remained unchanged during 1927.

Analysis of Separate Factors.—In a complex situation where many of the factors of sales, cost of sales, and expenses are found to vary from one period to another, it is necessary to isolate the separate items that are causing changes in net profits.

Changes in net profits that have resulted from variations in selling prices, should be segregated from changes due to fluctuations in physical volume sold, cost of sales, or expenses, in order to impute productivity to its proper source.

An increase in net profits which has resulted from reduced expenses of operations, from reductions in costs of sales, or from increased sales volume would call for a greater commendation than would be the case of a profit increase that resulted from an increase in sales prices. Expense controls indicate improved organization technique; increasing prices may be due to factors in the general business conditions over which the sales department has but little control, and for which less credit should be given. Greater credit is due the selling force when the volume has been increased in a period of general declining prices, than in periods of advancing prices.

Accounting for Differences.—From a mathematical standpoint, in order to isolate the separate factors that have resulted in alterations in profits, it is necessary to ascertain what the individual items of (1) prices, (2) sales volume, (3) cost of sales, and (4) expenses would have been in this period, if no changes had taken place.

If prices have changed, the total sales should be brought back by the per cent or dollar amount of change. If sales prices have been advanced by 5%, the total sales should be reduced by this figure. The result will give the corrected volume, minus any price change. The difference between the current sales and the reduced sales, equalling the 5%, is a price change.

The sales volume found after this price adjustment is comparable to last year's volume. The difference in the amounts is a volume change. The net profit resulting from the change is the old net profit rate on the difference in volume.

Sales Used as Base.—The per cents of this year's cost of sales and expenses should be measured against the revised sales to check variations. The former per cents are used in order to ascertain what this period's costs and expenses would have been if no variations had taken place. Last year's per cents of sales are considered as standard for comparison. Applied to this year's sales (revised by price changes), an index is given for the variation in each item. Theoretically, each cost or expense item should bear the same relationship to sales this period as in the last period. If selling expenses were 6% of sales last year, they should be the same this period. If they are higher or lower than this figure, a direct change in profits results.

However, to be comparable, this year's sales totals should be revised by any price change that may have taken place this year, as previously mentioned.

Cost of Sales Used as Base.—If cost of sales is used as a base for measuring change in (cost) volume, or for checking variations in expenses, this year's cost of sales should be revised by any change in the unit cost of goods sold. For example, if cost of sales have advanced 5% over last period, the current cost should be reduced by this figure before comparing volume or expenses. If expenses are based on cost of sales, instead of sales, the revision in cost of sales should be carried out before any variations are measured.

Price Variation: Costs Unaltered.—In the following illustration it is known that cost of sales have remained the same during the second year:

	1926	% of Sales	1927
Sales	$500,000	100	$575,000
Cost of Sales	400,000	80	440,000
Gross Profit	100,000	20	135,000
Expenses	75,000	15	82,500
Net Profit	$ 25,000	5	$ 52,500

The sales of 1926 amounting to $500,000 increased to $575,000 in 1927, while costs rose from $400,000 to $440,000. Since unit costs were unaltered, the new volume measured in terms of cost was $40,000, while at selling prices it was $50,000, based on the 1926 figures. If we use the same gross profit rate of 20% on the former sales, the new volume of

1927 would have been $550,000 ($440,000 ÷ 80%). Since the actual sales were $575,000, the difference ($575,000 — $550,000) must have been due to price changes. The actual difference in physical volume of $50,000 ($550,000 — $500,000) taken at the previous net rate of 5% on sales, gives $2,500 gain on the new volume. The per cent of selling expenses to the physical volume of 1927 shows no change. In summary form the cause for variation in net profits may be shown as follows:

1. Gain in prices		$25,000
Actual 1927 sales	$575,000	
1927 sales adjusted to 1926 level ($440,000 ÷ 80%)	550,000	
Difference	$ 25,000	
2. Gain due to volume		2,500
1927 sales adjusted to 1926 price levels (as above)	$550,000	
1926 sales at same prices	500,000	
Difference in volume	$ 50,000	
1926 net rate	5%	
Net gain	$ 2,500	
3. Gain on expenses		0
1927 sales reduced to 1926 price levels	$550,000	
1926 expense rate	15%	
1927 expenses should be	$ 82,500	
1927 actual expense	82,500	
4. Total gain in profits		$27,500

Control Over Variable Expenses.—A report showing causes for variation in net profits can be used for "spotting" variable expense items that vary with sales volume, which have become out of line during the current period. The method of locating unfavorable trends (see Figure 23) in the detailed expense items consists in comparing the first period per cents (based on sales) with the per cents of the present period. Control over these items is based upon the assumption that a direct causal relationship exists between sales volume and the expenses incidental to the conduct of the sales function. The method can be adopted only in those concerns where operating conditions are relatively simple and where a direct relationship exists between expenses and sales volume. A secondary check may be made on these expenses by comparing each item with the total of the expense group. The report aids in isolating the items that should receive further review of the sales departmental head or the comptroller who is charged with holding expenses to the minimum.

Selling Expenses	1926		1927	
	Amounts	% Net Sales	Amounts	% Net Sales
Taxes (Selling)	$ 550.00	0.2715	$ 675.00	0.2690
Insurance	1,875.00	0.9255	1,990.00	0.7932
Advertising	7,137.50	3.5230	8,150.00	3.2485
Sales Salaries	22,842.50	11.2748	34,375.50	13.7016
Sales Commissions	4,255.00	2.1002	8,435.50	3.3623
Sales Traveling Exp	6,843.50	3.3779	8,112.00	3.2333
Depr. Sales Equipment	1,822.00	0.8993	1,850.00	0.7374
Delivery Expense	3,775.00	1.8633	3,540.00	1.4110
Misc. Selling	995.00	0.4911	1,355.00	0.5401
	$50,095.50	24.7266	$68,483.00	27.2964

Figure 23. Showing Per Cent of Each Selling Expense Item to Net Sales

First-Year Per Cents Used as Standards.—By using the first year's per cents of sales as a basis of comparison, those items that have advanced unduly above the former figure can be readily detected. In the illustrated case (see Figure 24) the items that have become out of line and are causing losses are sales salaries and sales commissions. Normally these are rated as "controllable" expenses, that is, internally checked and amenable to administrative veto. The items that have been kept within bounds and upon which savings have been made are: insurance, advertising, sales traveling expenses, depreciation on sales equipment, and delivery expenses. All of these latter costs are rated as controllable except depreciation and insurance.

	1927 Expenses Should Be	1927 Actual Expenses	Losses Based on % of Sales	Gains Based on % of Sales
Taxes (Selling)	$ 681.16	$ 675.00		$ 6.16
Insurance	2,321.96	1,990.00		331.96
Advertising	8,838.75	8,150.00		688.75
Sales Salaries	28,287.01	34,375.50	$6,088.49	
Sales Commissions	5,269.13	8,435.50	3,166.37	
Sales Traveling Exp	8,474.71	8,112.00		362.71
Depr. Sales Equipment	2,256.22	1,850.00		406.22
Delivery Expense	4,674.78	3,540.00		1,134.78
Misc. Selling	1,232.10	1,355.00	122.90	
	$62,035.82	$68,483.00	$9,377.76	$2,930.58
Net Loss	6,447.18			6,447.18
	$68,483.00	$68,483.00	$9,377.76	$9,377.76

Figure 24. Showing Losses and Gains in Selling Expenses Based on Per Cent of Net Sales

Individual Items Out of Line.—This report has served its primary purpose in bringing to the attention of management those items that have thus become out of line when contrasted with the volume of business put through the sales plant. The method of approach in locating the causes for the poorer showing of salaries and commissions and the improved showing of the other expense items is the next step in control and will be taken up later in the text as an applied phase of managerial technique.[3] This latter problem is one of operating standards applied to the selling field.

Where articulated with the complete profit and loss statement (see Figure 25), the variation in net profits report shows the direct proportion of the total loss that has been caused by the selling department as a separate operating unit.

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[3] See Chapters XXI and XXII.

	1926	%	1927	%
Sales	$202,598.00	100.00	$250,887.00	100.00
Cost of Sales	110,875.00	54.73	151,375.00	60.34
Gross Trading Profit	91,723.00	45.27	99,512.00	39.66
Selling Expenses	50,095.50	24.73	68,483.00	27.30
Trading Profit	41,627.50	20.54	31,029.00	12.36
Operating Expenses	25,432.00	12.55	26,375.00	10.51
Net Profit	$ 16,195.50	7.99	$ 4,654.00	1.85

Figure 25. Comparative Condensed Profit and Loss Statement

Based on the comparative profit and loss statements in Figure 25, the relative importance of the increase in selling expenses as a factor in causing the drop in net profits between years is shown in the following analysis:

Loss on cost of sales*		$14,073.08
Loss on selling expenses**		6,447.18
Total loss		$20,520.26
Gain in operating expenses ‡	$5,118.59	
Gain in net profits due to added volume in 1927 †	3,860.17	8,978.76
Net reduction in profits between years		$11,541.50

* Cost of sales 1927	$151,375.00
1927 cost of sales on 1926 basis, i.e., at the rate of 54.7266% of sales	137,301.92
Loss on increase in the cost of sales	$ 14,073.08
** Selling expenses 1927	$ 68,483.00
1927 selling expenses on 1926 basis, i.e., at the rate of 24.7266% of sales	62,035.82
Loss on selling expenses (Figures 23 and 24)	$ 6,447.18
‡ 1927 operating expenses on 1926 basis, i.e., at the rate of 12.5529% of sales	$ 31,493.59
Actual operating expenses	26,375.00
Gain on operating expenses	$ 5,118.59
† 1927 added volume (no change in prices)	$ 48,289.00
1926 rate of net profit	7.9939%
Gain due to added volume	$ 3,860.17

Variation in Cost of Sales and Net Profits.—The causes for variation in profits due to changes in the cost of sales are brought about by several factors that should be considered separately. An upward trend in the per cent of cost of sales or an absolute increase in the dollar cost of merchandise sold in a commercial concern usually is due to one or more of the following factors: (1) an increase in the buying prices over the former figures; (2) an improved quality of goods which is costing more per unit of sales; (3) losses of goods by theft, damage, etc.; and (4) underpricing of inventories. Decreases in costs may result from (1) an improved buying plan; (2) a decline in the quality of goods purchased which requires a lesser outlay for a given volume of business; and (3) overpricing of inventories.

In some of these instances, as is readily seen, the buying department may be directly responsible for the losses; but in other cases, where advances are due to economic factors, no direct responsibility should be placed on this department. Improvements may be the result of a better control system used in purchasing; or again, lower costs may result from purely business conditions over which the buyer has no control and for which no immediate credit should be given. It is important that full consideration be given to those factors that are controllable as well as to those that are beyond personal control, in order that the proper procedure may be followed in checking bad tendencies, encouraging favorable ones, and in placing responsibility for performance.

In a manufacturing concern the increase in the unit costs which are reflected in the cost of sales usually represents adverse producing conditions or possibly inefficiency on the part of the superintendent of production. If the added costs cannot be passed on to the consumer in the form of advanced selling prices, they will naturally result in a direct loss in proportion to the increase over last year's costs (or the standard costs). Savings in manufacturing costs will be reflected directly as a gain in gross profit.[4]

If no errors have been made in the inventory figures in the pricing of goods, the gross profit check will disclose whether an increase in costs, in either a commercial or a manufacturing concern, has been passed on to the consumer in the form of higher prices, or whether such increase has been absorbed by the firm as a loss in profits. Conversely, the gross profit check will show the amount of savings that have resulted in economies in manufacturing or buying over the preceding year.

Changing Costs and Changing Volume.—In order to isolate the portion of the gross profit change attributable to changing volume and also to changing costs, it is necessary to know either the per cent of the changes in selling prices, the changes in costs, or changes in volume. If it is known, for example, that the selling prices have remained the same between periods, it will be found that any change in total sales will be the direct result of a decreased or increased physical volume. If the sales prices have changed and the per cent increase in unit prices is known, the new sales totals may be reduced to the old level in order to determine what the volume would have been during the second year without a change in prices.

The same treatment should be followed where per cent cost changes are known. That is, if costs have varied between periods, it will be necessary to reduce the current costs to the former cost level in order to secure a measure of the volume change. Here volume would be measured by cost of sales. From either the former cost base or sales base, the change in volume can readily be determined, as can the variation in profits

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[4] The aggregate savings (or losses) made on the cost of manufacturing as revealed by the report showing variation in gross profit, will be the same as the total units produced multiplied by the savings (or losses) per unit.

For example, if statistics are kept on the units made and the amount of savings, let us say, in labor costs or materials costs, a check may be available for controlling the aggregate savings in factory costs for these particular cost items.

due to the new volume and the changes in the cost of sales as in previous cases.

In the following illustration the statistician reports that no changes have been made in selling prices.

	1926	%	1927	%	Difference
Sales	$500,000	100	$550,000	100	+$50,000
Cost of Sales	400,000	80	467,500	85	+ 67,500
Gross Profit	100,000	20	82,500	15	− 17,500
Expenses	75,000	15	82,500	15	+ 7,500
Net Profit	$ 25,000	5	$ 0	0	−$25,000

In report form the identification of cost of sales and volume changes and the resulting profit changes may be as follows:

1. 1927 cost of sales		$467,500
2. 1927 cost of sales on 1926 basis *		440,000
3. Decrease in gross profit due to increased costs		$ 27,500
4. Actual sales 1927	$550,000	
5. Actual sales 1926	500,000	
6. Increase in volume †	$ 50,000	
7. Increase in gross profit on added volume ‡		10,000
8. Loss in gross profit		$ 17,500
9. Increase in expenses as absolute differences		7,500
10. Total decrease in net profits		$ 25,000

*$550,000×80%=$440,000. The former gross rate on the current sales volume.
†Based on fact of no change in selling prices.
‡$50,000×20%=$10,000. The former gross profit rate used here on the added volume.

A decline in the physical volume of trade in this case with selling prices unaltered would have resulted in a greater loss in profit, the measure of which would be the former rate of gross profit on the current reduction in the volume. With information from the buying departments or from cost department to the effect that cost of sales had advanced 6.25% over the previous year, the same analysis could have been made covering changes in gross profit due to the upturn in costs and the savings that were made from the increased volume, as noted in the following report:

1. Actual costs 1927	$467,500	
2. 1927 costs on 1926 basis *	440,000	
3. Loss in gross profit due to increase costs	$ 27,500	
4. Increase in gross profit due to increased volume †	10,000	
Net reduction in gross profits		$17,500
5. Increase in expenses		7,500
6. Total reduction in net profits		$25,000

* $467,500 ÷ 1.0625 = $440,000. The 1927 costs reduced to the 1926 level.
† $50,000 × 20% = $10,000. The 1926 gross profit rate applied to the added volume of 1927.

Changes in Volume, Selling Prices and Cost of Sales.—In cases where all three factors of physical volume, selling prices, and cost of sales vary during the year, as is true in most instances, it is necessary to isolate each of these factors and determine its effect on profits between periods. In checking the productivity of the various factors, the important rule to follow in these as in all previous cases is to ascertain: (1) what would have been the sales volume during the second year if the identical conditions of mark-up and prices found in the first or standard year had carried over into the second year; and (2) what would have been the cost of sales during the second year if the identical conditions of mark-up and selling prices had carried over into the second year.

In the following case of advancing costs, advancing prices, and increasing volume, it is known that the sales price of goods increased 6.45% over the previous year. From the comparative profit and loss statement below, the identification of the price change, volume change, and the cost change can be traced to the variation in net profits. The underlying causes for the variation of these major factors is a question for investigation after their identification has been made.

	1926	1927	Differences
Sales	$600,000	$660,000	+ $60,000
Cost of Sales	480,000	515,000	+ 35,000
Gross Profit	$120,000	$145,000	+ $25,000

In report form the causes for the variation of $25,000 in gross trading profit are as follows:

1. Actual sales 1927	$660,000
2. 1927 sales reduced to 1926 basis *	620,000
3. Gain in gross profit due to increased prices	$ 40,000
4. Gain in gross profit on new volume †	4,000
5. Total gain from increased prices and new volume	$ 44,000
6. Loss in gross profit from increased costs ‡	19,000
7. Variation in gross profit from 1926–1927	$ 25,000

* $\frac{\$660,000}{1.0645} = \$620,000$. The 1927 sales reduced to 1926 basis.

† (a) The 1927 volume adjusted by price reduction (as above)		$620,000
(b) The actual 1926 volume in profit and loss statement		600,000
(c) Difference in volume measured in 1926 sales prices		$ 20,000
(d) The 1926 gross profit rate		20%
(e) Increase in gross profit on new volume		$ 4,000
‡ (a) The 1927 sales adjusted to 1926 basis		$620,000
(b) The 1926 cost of sales rate		80%
(c) The 1927 cost of sales on 1926 basis		$496,000
(d) Actual cost of sales 1927	$515,000	
(e) The adjusted cost of sales (c) above	496,000	
(f) Increase in cost of sales over the 1926 rate on 1926 sales	$ 19,000	

CHAPTER XVI

CONTROL OVER OPERATIONS—PROFIT AND LOSS STATEMENTS (CONTINUED)

Production Superintendent's Contribution to Net Profits.—Since in a manufacturing concern one of the most important functional officers is the production superintendent who has charge of the factory department, a detailed analytical manufacturing report should be drawn up that will show the full extent of the discharge of the responsibility of this officer.

Where goods are manufactured, the problem of control through the use of operating statements broadens out and includes all of the expense factors of direct labor, materials, superintendence, indirect labor, power, light and heat costs, factory repairs, depreciation on factory buildings and equipment, taxes, rent, factory office expenses, engineering costs, etc. In practice it will be found that some of these expense elements, notably factory overhead, tend to decrease in per cent of total manufacturing costs as the volume of production increases, and to increase as the volume declines, due to the well-known relationship that exists between fixed and variable expenses and changing output.

It will also be found in particular cases that certain of the individual items contained in the direct cost group (materials used and direct labor) and also items in the indirect or overhead cost group will vary within their respective groups and become "out of line" compared with the former year's cost figures or compared with some other standard. The ordinary system of accounting and statistical reports for a manufacturing concern is drawn up to show the periodic costs by major functions and to give a ready check on the tendency of costs and

	Present Month				Total Amount to Date			
	1926		1927		1926		1927	
	Amt.	% of Sales	Amt.	% of Sales	Amt.	% of Sales	Amt.	% of Sales
Net Sales								
Cost of Sales:								
Initial Inventory Finished Goods								
Materials Used								
Direct Labor Costs								
Burden Factory								
Final Inventory Finished Goods								
Gross Trading Profit								
Expenses:								
Sales Salaries								
Sales Commissions								
Sales Traveling Expenses								
Adver. Expenses								
Other Selling Expenses								
Total Selling Expenses								
Office Salaries								
Managers' Salaries								
Office Supplies								
Light, Heat, Janitor Services								
Other Office Expenses								
Total Administrative Expenses								
Profit from Operations:								
Financial Expenses								
Financial Income								
Extraneous Profits or Losses								
Net Profit or Loss for Period								
Federal Taxes								
Dividends Paid								
Net Profits to Surplus								
Total Capital Employed								
Per Cent Net Profit to Total Capital Used								
No. Units Produced Per Dollar Capital Used								
Turnover Working Assets								
No. of Units Produced Per Dollar Working Assets								
Average Age Payables								
Average Age Receivables								

Figure 26. Current Monthly Statement of a Typical Manufacturing Concern

profits. In brief, the greatest use of all such reports should be the "spotting" of those individual costs that should receive the attention of management.

The more frequently reports are rendered, the closer will be the check on bad tendencies, and the sooner remedies may be devised to stop the unfavorable trends. A suggested form for such a report (Figure 26) shows the sales; the (manufacturing) costs of sales; the items of selling, administrative, and financial expense; and net profit for the present month this year and for the corresponding month last year, with per cent of sales for guidance in showing trends of items that have become out of line. The cumulated amount of these same items which shows the income and costs from the beginning of the fiscal year to date are also shown in same report.

Need for Cost Reports.—However, the current monthly reports as outlined above are not adequate for giving control over the details that make up the totals. A detailed report covering the individual cost items in the factory should be made. A cost accounting system is normally necessary for such a report. Much of these data (see Figure 27 for a suggested form) is based on the factory ledger secured only from the cost accounts.

Such a report shows the current monthly amount of all significant cost items for the present year and for the corresponding month last year expressed in dollars and in unit costs. In the factory overhead department the cost of each item per labor hour is also indicated. A monthly cost for these same items cumulated to date for the current year and for the past year may be added to give a barometer of volume put through the plant and a unit cost on the total output to date.

Supporting Statistical Reports.—A supporting statistical report (Figure 28) which should be issued periodically with the monthly operating statements, makes use of all critical in-

	Present Month					Total Amount to Date			
	1926			1927		1926		1927	
	Unit Costs	Amt.	% of Mfg. Costs	Amt.	% of Mfg. Costs	Amt.	% of Mfg. Costs	Amt.	% of Mfg. Cost
PRIME COSTS:									
Raw Materials used A									
Raw Materials used B									
Direct Labor Costs									
Bonus to Direct Labor									
Total Prime Costs									
			Cost per Labor Hour		Cost per Labor Hour				
FACTORY OVERHEAD:									
Foremen's Wages									
Superintendents' Salaries									
Power and Heat									
Factory Supplies									
Laboratory Expenses									
Repairs to Factory Buildings									
Repairs to Mach. and Equip.									
Depreciation on Buildings									
Depr. on Mach. and Equip.									
Taxes, Fact. Bldg. and Equip.									
Insurance Factory									
Insurance Industrial									
Factory Office									
Engineering Costs									
Misc. Factory Expenses									
Total Factory Overhead									
Total Cost of Manuf. Products									
Total Direct Labor Hours									
Factory Overhead per Direct Labor Hour									
Difference in Inventories Finished Goods									
Cost of Goods Sold									
TURNOVERS OF INVENTORIES:									
Materials A and B									
Goods in Process*									
Finished Goods									
Factory Supplies									

* Goods in Process Inventories should be distributed to Direct Labor, Materials and Miscellaneous Factory Expenses, in order to show the correct net cost for each of these elements of cost.

Figure 27. Current Monthly Manufacturing Cost Report

formation related to the physical output in terms of unit costs of production, the number of units produced per dollar invested in various departments and in the plant as a whole, and the unit costs of selling, administration, and financial expenses. To make the report complete, the outside income and expenses data may be appended. Significant sales ratios are important data included here to correlate the sales function with those factors that are immediately involved as sales production factors. These cover the ratio of sales to plant, sales to working assets, and

sales to trade debtors. The report should be closely tied to the balance sheets and exhibited in conjunction with that statement as shown previously.

	Amount 1924	Amount 1925	Amount 1926	Amount 1927
Number of Units Produced				
Manufacturing Cost per Unit				
Number of Units per Dollar in Plant				
Sales: Amount in Dollars				
Ratio of Sales to Trade Debtors				
Ratio of Sales to Finished Goods				
Ratio of Sales to Plant Investment				
Ratio of Sales to All Assets				
Ratio of Sales to Working Assets				
Gross Trading Profits				
Per Cent of Cost of Sales to Sales				
Gross Profit Per Unit of Output Sold				
Selling Expenses Per Unit of Output Sold				
General Expenses Per Unit of Output Sold				
Financial Expenses Per Unit of Output				
Total Expenses Per Unit of Output				
Net Operating Profits				
Net Operating Profit Per Unit of Output				
Extraneous Profits				
Extraneous Losses				
Total Net Profit for Year				
Per Cent of Total Net Profit on Capital Stock and Surplus				
Per Cent of Total Net Profit on All Assets				
Dividends Paid on Preferred				
Dividends Paid on Common				
Rate on Preferred Stock				
Rate on Common Stock				
Per Cent of Earnings Paid in Dividends				
Net Addition to Surplus for Year				
Total Earnings for Year on Common				
Turnover of all Inventories:				
a. Raw Materials				
b. Goods in Process				
c. Finished Goods, Dept. A				
d. Finished Goods, Dept. B				
e. Factory Supplies				

Figure 28. Condensed Statistical Report of Operations of a Typical Manufacturing Concern

The primary purpose of these more detailed statistical reports is the early detection of operating difficulties. Where no budget system or operating standards are in force, these detailed reports function as a check upon current performance, the standard of which is the costs of past periods. In other special cases the reports may be used to check operations against standard costs.

Manufacturing Indices.—By postponing consideration of the causes for the variation in the individual cost items and centering attention on the measuring device that may be used to identify the elements of manufacturing costs that are out of line, hence causing a direct variation in net profits, it may be noted that there are two independent but concurrent checks on manufacturing cost items found in operating statements that may be used to identify the variations in costs and profits. These methods are, first, the comparison of the individual factory costs to net sales; and second, the comparison of the individual costs to total manufacturing costs. The one compares the differences in costs between years by using per cent of sales as a basing point; the other uses the per cent of production costs.

Comparative Manufacturing Cost Items Based on Sales.—The final price or "cost to the consumer price" naturally covers all costs, including buying or processing costs, selling costs, administrative costs, financial costs, plus a net profit to the seller. This applies to individual goods, to lines of goods, and to the total goods handled during the year. In pricing goods, competition largely sets the limits of the price for the various commodities handled; therefore, it is essential that costs at all times be kept in line with the selling prices which are largely if not entirely a question of market determination.

Since production costs, then, are planned on the basis of an assumed standard or on a previous selling price for a specific commodity or a line of goods, it is possible at the close of any monthly or quarterly period to determine whether or not the integral expense items going to make up the total manufacturing cost have been kept in line with last year's or the "standard" costs for the individual items; and more particularly it is possible to show the immediate effect of changes in individual costs on the profit for the period under review.

The performance for the year as measured by the ratio of each manufacturing expense item to sales will divulge the fact whether these items have been kept in line with the previous year's percentages of sales. If the individual items and also the aggregate manufacturing costs have remained unchanged between periods in their relationship to sales, no change will result in the gross or net profit which can be attributed to expenses as such. If changes have occurred, the question then is that of determining, first, the reason why these items have become out of line, and second, if the item is subject to administrative control.

Fixed and Variable Expenses.—If all expenses in a purely merchandising concern and all factory costs in a manufacturing concern rose and fell proportionately with the volume of business done, the only problem of successful control would consist of correlating all expenses with changes in sales, assuming that prices and volume were sufficiently high to cover all costs. But, since it is physically impossible to sell or process goods without the investment in a plant, which in turn entails the payment of a series of fixed costs that bear no direct relationship to the physical volume, a dual problem of control confronts management, viz., the computation of a price policy and volume output that will produce: (1) an irreducible primary income sufficiently large to cover the direct costs that rise and fall more or less directly with volume; and (2) a secondary income sufficiently large to cover the fixed expenses that have little direct relationship to physical volume, and (3) a net profit.

Efficiency Standards Required.—Control over net profits consists, then (1) in working out a schedule of anticipated unit costs and total costs for both fixed and variable items in conjunction with changing physical volume; and (2) in properly accounting for the differences in actual performance compared with these pre-planned costs. The first standard problem attempts to answer the question propounded by the budget committee in making up amounts for all expense quotas, viz., what should be the amount of individual items of direct and overhead expenses for the year and hence the unit cost for each of the fixed (and semi-fixed) expenses at various rates of output?

A certain sales volume, for example, for one year or one month with a definite cost of sales (which includes all manufacturing expenses), and a set schedule of selling, administrative, and financial expenses, will require a completely revised schedule of manufacturing costs and expenses if the volume be increased or decreased during the second period. How can these second-year quotas be determined in advance and later measured, and what is the criterion of efficiency as shown in the operating statements? In short, what test has management that a second year's or a third year's profit and loss and manufacturing statement represents perfect performance on the part of all departmental heads charged with operations? Operating statements themselves do not provide such standards except in cases where past reports, for example, the previous year or the average for a series of years, are accepted as standards.

Relationship of Factory Costs to Sales Volume.—Certain of the costs and expenses, namely, raw materials used, direct labor, most of the selling expenses, and in some cases, sales discounts, are consistently variable and should normally bear a definite relationship to sales, providing selling prices have not varied between periods. The semi-constant costs, such as facilitating labor, power costs, and many general administrative expenses, bear only an indirect relationship to sales and hence cannot be controlled directly by a per cent of sales figure. The fixed factory costs, such as factory depreciation, patent costs.

EASTERN METAL PRODUCTS COMPANY

December 31

	1925	% of Sales	1926	% of Sales	1927	% of Sales
Sales	$250,000	100.00	$260,000	100.00	$250,000	100.00
Cost of Sales	200,000	80.00	210,000	80.77	195,000	78.00
GROSS PROFITS	$ 50,000	20.00	$ 50,000	19.23	$ 55,000	22.00
Sales Salaries	15,000	6.00	16,000	6.16	17,000	6.80
Advertising	5,000	2.00	5,000	1.92	6,000	2.40
Delivery Expenses	3,500	1.40	3,800	1.46	3,600	1.44
NET TRADING PROFIT	$ 26,500	10.60	$ 25,200	9.69	$ 28,400	11.36
Office Expenses	4,500	1.80	5,000	1.92	4,000	1.60
Insurance	1,000	0.40	1,200	0.46	900	0.36
Rent	6,000	2.40	6,000	2.31	6,000	2.40
Light and Heat	2,500	1.00	2,400	0.92	2,000	0.80
NET OPERATING PROFIT	$ 12,500	5.00	$ 10,600	4.08	$ 15,500	6.20
Interest	500	0.20	700	0.27	200	0.08
Sales Discount	2,000	0.80	2,200	0.85	1,800	0.72
NET PROFIT FOR THE PERIOD	$ 10,000	4.00	$ 7,700	2.96	$ 13,500	5.40
MANUFACTURING COSTS*.						
Raw Materials used	125,000	50.00	130,000	50.00	120,000	48.00
Direct Labor Costs	40,000	16.00	42,000	16.15	35,000	14.00
TOTAL DIRECT COSTS	165,000	66.00	172,000	66.15	155,000	62.00
Indirect Labor	20,000	8.00	21,000	8.08	20,000	8.00
Power Costs	8,000	3.20	10,000	3.84	9,000	3.60
Depreciation	5,000	2.00	5,000	1.92	8,000	3.20
Insurance, and Miscellaneous	2,000	0.80	2,000	0.77	3,000	1.20
TOTAL BURDEN	35,000	14.00	38,000	14.61	40,000	16.00
TOTAL MANUFACTURING COSTS AND COSTS OF SALES	$200,000	80.00	$210,000	80.76	$195,000	78.00

* Goods in Process allotted to Labor, Materials, and Miscellaneous Overhead Expense.

Figure 29. Comparative Profit and Loss and Manufacturing Statements

engineering, and all service department costs, insurance, rent, taxes, together with the fixed selling and office expenses, capital interest costs and such items, bear no direct relationship to volume, hence cannot be controlled by comparisons with the sales figures. Both the semi-constant and the fixed costs must be checked against "institutional" standards, those of the shop, office, etc., or against budget standards. In many business concerns the per cent of sales method is used for controlling both the direct and the semi-constant expenses. The plan of using per cent of sales for standards is adaptable to commercial plants where the majority of costs are directly allied to the selling function.

The following illustrations based on the data of the Eastern Metal Products Company (Figure 29) give a suggested plan for analyzing an operating statement for control purposes. Control over variable, semi-constant, and fixed costs is based here on a per cent of sales.

The variable costs and expenses of the Eastern Metal Products Company, those directly related to sales volume and to-

	Variation in Per Cents Based on 1926 Sales	Increase	Decrease
Raw Materials	0		
Direct Labor	.001538	$ 400	
Sales Salaries	.001538	400	
Delivery Costs	.000615	160	
Advertising Costs *	.000769		$ 200
Sales Discounts †	.0004615	120	
Totals	....	$1,080	$ 200
Loss in Net Profits	....		880
		$1,080	$1,080

* Advertising may be classified as a semi-constant expense in many instances.

† Sales discounts may bear no direct relationship to sales, due to change in discount policies and may be classified as a deduction from sales.

talling 76.2% of the 1926 net sales, showed the changes in amounts given above, based on a per cent of sales.

The semi-constant costs and expenses indirectly related to volume and amounting to 11.2% of the 1926 sales showed the following changes in amounts based on a per cent of sales:

	Variation in Per Cents Based on 1926 Sales	Increase	Decrease
Indirect Labor	.000769 +	$ 200	
Power Costs Factory	.006461 +	1,680	0
Totals		$1,880	
Loss in Net Profits			$1,880
		$1,880	$1,880

The fixed costs and expenses unrelated to volume and amounting to 8.6% of sales showed the following changes in amounts based on a per cent of sales:

	Variation in Per Cents Based on 1926 Sales	Increase	Decrease
Factory Depreciation	.0007690		$200
Insurance (Factory)	.0003077		80
Insurance (Administrative)	.0006154	$160	
Rent	.0009231		240
Office Expenses	.0012306	320	
Interest	.0006992	180	
Light and Heat	.0007690		200
Totals		$660	$720
Gain in Net Profits		60	
		$720	$720

In summary form the causes for variation in the net profits between the second and the first year as revealed in the per cent of variable, semi-constant and fixed expenses to sales, are shown in the following form:

EASTERN METAL PRODUCTS COMPANY

	Sales Volume	Variable Expenses	Semi-Constant Expenses	Fixed Expenses	Totals
Losses		$880	$1,880		$2,760
Gains	$400*			$60	460
Variations in Net Profits between Years					$2,300

*The $10,000 added volume at the 1925 net rate of 4% on sales.

Conclusion.—If the standard for all individual or group of expenses is based on a given per cent of sales as a norm, or "par in performance," it is obvious that those items that failed to decline or rise in per cents commensurate with the rise or fall in sales volume, are the only ones that would register "out of line." However, it must not be forgotten that it is the normal phenomenon for fixed expenses to fall less rapidly than sales; hence these expense items that register "out of line" may be in perfect alignment so far as efficiency in handling funds is concerned.

Primary Income, Secondary Income and Net Profits.—The operating data of a manufacturing concern may be drawn up to show the significant relationship between (1) the primary income (gross revenue), (2) variable costs (allied to the sales function), (3) secondary income, (4) semi-constant costs, (5) fixed costs, and (6) net profit. The statement of the Eastern Metal Products Company given on the following page, illustrates the form of such a report, which should be read in conjunction with those on pages 276 and 277.

EASTERN METAL PRODUCTS COMPANY
STATEMENT OF PRIMARY INCOME, SECONDARY INCOME, AND NET PROFITS
1925–1926

	1925	% of Primary Income	1926	% of Primary Income
1. Primary Income (Sales).....	$250,000	100.0	$260,000	100.0
2. Variable Costs.............	190,500	76.2	199,000	76.5
3. Secondary Income.........	59,500	23.8	61,000	23.5
4. Semi-Constant Costs.......	28,000	11.2	31,000	12.0
	31,500	12.6	30,000	11.5
5. Fixed Costs...............	21,500	8.6	22,300	8.6
6. Net Profit for Year........	$ 10,000	4.0	$ 7,700	2.9

Such a suggested financial statement rearranged on the basis of this grouping of expenses would show: (1) the "primary income (sales)," from which is deducted the variable costs which tend to fluctuate with volume of business; (2) the "secondary income,"[1] from which is deducted the semi-constant and fixed expenses; and (3) "net profit." The direct comparison between primary income and primary costs reveals whether or not the total volume of any year, or the volume of a particular department or line of goods, is paying its own direct costs. An increasing volume sold at a level below direct costs, inevitably will cause increasing losses directly in proportion to the volume of transactions.

In times of depression, when a firm is often able to cover only a portion of the overhead costs, it is necessary to know, first, if the prime costs of production and selling are being covered in total sales, and second, the amount remaining for secondary purposes, i.e., to cover all semi-constant and overhead costs.

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[1] "Secondary income" corresponds to the usual gross trading profit in this illustration.

The size of the "secondary income" indicates the amount of money available for paying the interest on borrowed funds, the cost of administration, and similar overhead costs. The covering of these expenses, providing the primary costs are recovered, is largely a question of volume. In any successful going concern the primary income should cover the direct costs; otherwise no net profit could be made regardless of volume. An abnormally small margin of "secondary" profit (an amount above primary costs) per unit of sales, can be turned into a net profit providing a sufficient volume of business can be procured; hence, the policy in depressions of low prices and large volume.

Variable Expenses Based on Sales: Semi-Constant as Absolute Differences.—Since many of the costs of the Eastern Metal Products Company are either semi-constant or fixed, as is the case with many such concerns with a sizable overhead, a second statement should be made that shows: (1) the differences in variable expenses that are directly related to sales, in terms of per cents of sales, (2) the semi-constant, and (3) fixed expenses as actual differences in amounts. By grouping the variable expenses and comparing them with sales, a ready guide can be supplied for checking those costs that are out of line with sales. The statement shows how much they have varied from the normal or "standard" per cent of sales as was shown in the previous case. The showing of the overhead costs as absolute differences allows a direct comparison one year with the next of the continuing costs that have no direct relationship to sales volume and hence require a different technique for control. The following three exhibits show variation in net profits due (I) to changes in variable costs based on per cent of sales; (II) variation in semi-constant costs based on absolute differences; and (III) variations in fixed costs based on absolute differences.

I. CHANGES IN VARIABLE COSTS BASED ON PER CENT OF SALES

	% of 1925 Sales	1926 Costs Based on 1925 Percentages	Actual 1926 Costs	Decreases	Increases	Decrease in Net Profit	Increase in Net Profit
Materials..........	50.0	$130,000	$130,000				
Direct Labor.......	16.0	41,600	42,000		$400	$400	
Selling Expenses*...	9.4	24,440	24,800		360	360	
Sales Discounts.....	0.8	2,080	2,200		120	120	
Totals.........	76.2	$198,120	$199,000	0	$880	$880	0
Net Loss in Profits due to increase in Variable Costs..........						......	$880

* See Figure 29.

II. ABSOLUTE DIFFERENCES IN SEMI-CONSTANT COSTS

	1925	1926	Decreases	Increases	Decrease in Net Profit	Increase in Net Profit
Indirect Labor......	$20,000	$21,000		$1,000	$1,000	
Power Costs (Factory)	8,000	10,000		2,000	2,000	
Totals.........	$28,000	$31,000	0	$3,000	$3,000	0
Net Loss in Profits due to increases in Semi-Constant Costs					....	$3,000

III. ABSOLUTE DIFFERENCES IN FIXED COSTS

	1925	1926	Decreases	Increases	Decrease in Net Profit	Increase in Net Profit
Factory Depreciation	$ 5,000	$ 5,000				
Insurance Factory...	2,000	2,000				
Insurance Administ..	1,000	1,200		$200	$200	
Rent...............	6,000	6,000				
Office Expenses.....	4,500	5,000		500	500	
Interest............	500	700		200	200	
Light and Heat.....	2,500	2,400	$100			$100
Totals.........	$21,500	$22,300	$100	$900	$900	$100
Net Loss in Profits due to increases in Fixed Expenses...					....	800
					$900	$900

The causes for the variation in the net profits would be shown thus:

(a) Loss on variable costs based on 1925 per cent of sales (See I above)..................................	$ 880	
(b) Loss on semi-constant costs shown as absolute differences (See II above)............................	3,000	
(c) Loss on fixed costs shown as absolute differences (See III above)....................................	800	
Total losses...		$4,680
(d) Gain in secondary income *..............................		2,380
Decrease in net profits....................................		$2,300

*Gain in secondary income:

Sales 1926..	$260,000	
Sales 1925..	250,000	
Difference in sales..............................	10,000	
Secondary income rate 1925 (See page 274.)...........	23.8%	
Gain in secondary income..................................		$2,380

The plan is applicable to plants where no unit costs are developed as a part of the control system. It is being actively used in cases where a large number of lines of small articles such as novelties, cutlery, etc., are being manufactured.

Outside of the manufacturing field, for instance, in larger department stores, where the sales are divided into distinctive departments and many of the expenses are closely related to volume, the per cent of sales control for the direct selling expenses, and a comparison of the absolute difference for the balance of the expenses, is being employed in many cases. It has been adopted in other instances where distinctive lines of goods are handled, and where volume and selling costs are closely related.

Variation in Manufacturing Cost Items Based on Total Production Costs.—It must be recognized that any comparative manufacturing cost statement has decided limitations in the field of control over production costs, because of the narrow scope of the data contained in these reports. In small plants and where operations are simple, a measure of control may be exercised over prime and indirect manufacturing cost items through the use of frequently rendered statements that compare the per cent of the integral costs to the total manufacturing costs for the current month or quarter this year with a previous month or quarter. If the operations are continuous, each month's per cent can be checked with the preceding month, or with a period in the past when general operating conditions were substantially similar to the current period.

A comparative manufacturing cost statement, basing the per cent of each integral cost upon total production costs, serves primarily as an indicator of tendencies of each cost element. When rendered frequently, before a situation becomes out of hand and before serious errors have been committed, this type of report may function in its own field as a check against operating losses that result from faulty manufacturing conditions, internal in nature and subject to managerial control. Such statements are in no wise a substitute for cost account-

EASTERN METAL PRODUCTS COMPANY

1926–1927

	1926 Costs	Per Cent of Manufacturing Cost	1927* Costs on Basis 1926 Per Cents	Actual Manufacturing Costs 1927	Difference
Cost of Sales	$210,000	100.00	$201,924	$195,000	$6,924 gain
Materials†	130,000	61.91	125,010	120,000	5,010 gain
Direct Labor	42,000	20.00	40,384	35,000	5,384 gain
Indirect Labor	21,000	10.00	20,190	20,000	190 gain
Power Costs	10,000	4.76	9,611	9,000	611 gain
Depreciation	5,000	2.38	4,809	8,000	3,191 loss
Insurance & Misc	2,000	0.95	1,920	3,000	1,080 loss
Totals	$210,000	100.00	$201,924	$195,000	$6,924 gain

Savings made in Manufacturing Costs			$6,924
Loss in Sales Volume ($10,000 × 19.24% 1926 gross profit rate)			1,924
Difference in Gross Profit			$5,000
Analysis of Expenses: (Absolute Differences)			
Gains:			
Delivery Expenses	$ 200		
Office Expenses	1,000		
Insurance	300		
Light and Heat	400		
Interest	500		
Sales Discounts	400	$2,800	
Losses:			
Sales Salaries	$1,000		
Advertising	1,000	2,000	
Net gain in expenses			800
Total gain in profits over 1926			$5,800

* On the 1926 per cent basis the manufacturing cost items here show what the cost would have been for the second year if no variations had been made from the former per cent of total costs.

† Finished goods inventory and process inventory have been distributed to materials, labor, and miscellaneous expenses.

Figure 30. Variation in Profits Caused by Changes in the Per Cent of Each Cost Item to Totals. Cost of Sales Adjusted to Former Per Cent of Sales.

ing systems, nor budgets, but may be used where these systems are not employed.

Naturally a follow-up plan must be instituted where such limited reports are employed, in order to locate specific operating factors that are causing the trouble registered in the comparative statements.

The report of the Eastern Metal Products Company for the year 1926-1927 in Figure 30 shows the system of reporting described above. It shows those items that are out of line and to what extent the change in costs have caused a variation in the profits for the year.

Unit Cost Reports.—A unit manufacturing cost report shows the expenses of each manufacturing item per unit of product made. It shows the materials, labor, and burden outlay required for each physical unit produced by the factory. A subdivision of the burden group may be made which gives the cost per unit for each overhead item.

The report indicates whether the cost to produce and sell has been kept to the minimum, where goods are made on contract; or whether the article is being produced at a satisfactory profit, where the sales price is determined by competition.

The statement may be expanded to include the unit sales price, operating expenses, and net profit for each unit sold.

An additional advantage is gained by making the report out in comparative form showing the trends of manufacturing costs and operating expenses for each unit handled.

Such a report for the New England Implement Company is given on the following page. (See Figure 31.)

The unit cost report likewise furnishes the means for locating the items of cost that have become out of line compared with previous costs. In this respect it serves a similar purpose to the statement that shows the per cent of each item of manufacturing cost to sales, or to total manufacturing costs.

NEW ENGLAND IMPLEMENT COMPANY
UNIT REPORT

December 31

	1925	1926	1927	1928
Begin. Inv. Finished Goods	7,500	8,000	9,500	11,000
Number of Units Produced	200,000	195,000	210,000	240,000
	207,500	203,000	219,500	251,000
Final Inv. Finished Goods	8,000	9,500	11,000	15,000
Number of Units Sold	199,500	193,500	208,500	236,000
Selling Price	$1.2500	$1.2381	$1.2820	$1.2744
Begin. Inv. Fin. Goods	1.0371	1.0000	1.0769	0.9286
Raw Materials	0.6250	0.6666	0.5714	0.5417
Direct Labor	0.2000	0.2154	0.1667	0.1875
Total Direct Costs	0.8250	0.8820	0.7381	0.7292
Indirect Labor	0.1000	0.1077	0.0952	0.1000
Power Costs	0.0400	0.0513	0.0429	0.0333
Depreciation	0.0250	0.0256	0.0381	0.0250
Miscellaneous	0.0100	0.0103	0.0143	0.0083
Total Burden	0.1750	0.1949	0.1905	0.1666
Total Manufacturing Costs	1.0000	1.0769	0.9286	0.8958
Final Inv. Fin. Goods	1.0000	1.0769	0.9286	0.8958
Cost of Sales	1.0014	1.0737	0.9353	0.8974
Gross Profit	0.2486	0.1644	0.3467	0.3770
Selling Expenses	0.1178	0.1282	0.1276	0.1186
Admin. Expenses	0.0652	0.0754	0.0618	0.0657
Financial Expenses	0.0125	0.0150	0.0096	0.0123
Total Expenses	0.1955	0.2186	0.1990	0.1966
Net Profit or Loss*	0.0531	0.0542*	0.1477	0.1804

Figure 31. Showing Selling Prices, Costs, Expenses, and Net Profit per Unit of Product Manufactured and Sold

However, the unit cost report has an advantage over the per cent of sales report because it measures manufacturing costs independently of sales. Changes in sales volume are often affected by changes in selling prices, which have no direct bearing on manufacturing costs.

A report showing the per cent of production costs to sales tells whether the various cost items are being kept in line with sales and whether profits are being made on various lines manufactured, but does not locate uneconomical manufacturing procedures in the way that a unit cost report does.

Efficiency in Handling the Manufacturing Outlay.—The desideratum in a production program from an operating and also a financial viewpoint is a maximum flow of goods out of the plant into trade channels and a minimum holdover of goods in the inventories. The smaller the proportion of the current production costs represented in goods in process and finished goods at the close of the year, the more successful has been the handling of the funds spent for production purposes.

The larger the final inventories compared to the portion of manufactured goods sold, the less successful has been the handling of funds. Large inventories remaining unprocessed in the plant and goods in the warehouse tie up credit and involve an interest outlay and other incidental handling costs.

A single statistical report (Figure 32) shows the distribution of total annual production outlay in (1) final goods in process inventory, (2) finished goods manufactured and sold this period, and (3) finished goods manufactured and on hand at the close of the period. It gives an important idea of the success of the comptroller in correlating the activities of the production department working in cooperation in the sales department and the financial department.

Northern Lime Company

	1925		1926		1927	
Total Annual Manufacturing Outlay:						
Goods in Process, January 1	$ 8,500		$ 8,000		$ 7,500	
Materials Used	95,300		108,600		104,700	
Direct Labor Costs	110,800		125,750		122,850	
Factory Overhead	79,370		85,675		87,430	
Total Outlay for Year	$293,970		$328,025		$322,480	
	Amt.	%	Amt.	%	Amt.	%
Distribution of Manufacturing Outlay:						
Goods in Process, December 31	$ 8,000	2.7	$ 7,500	2.3	$ 5,000	1.6
Goods Manuf. and Sold*	263,220	89.6	302,675	92.3	312,300	96.8
Finished Goods, December 31	22,750	7.7	17,850	5.4	5,180	1.6
Totals	$293,970	100.00	$328,025	100.00	$322,480	100.00

* Manufactured goods produced and sold during the current year are computed as follows:

	1925	1926	1927
Cost of Goods Sold	$288,595	$325,425	$330,150
Finished Goods, January 1	25,375	22,750	17,850
Manufactured Goods Produced and Sold during year at Cost	$263,220	$302,675	$312,300

Figure 32. Distribution of Total Annual Manufacturing Costs

The Ratio of Purchases to Inventories.—A check upon the correlation of the work of the purchasing agent with the manufacturing department may be secured in a report that shows the ratio of purchases to the raw materials inventory at the close of the year.

Ratio of Raw Materials to Purchases

	1926	1927
Purchases of Materials	$752,695	$820,359
Raw Materials Inventory, December 31	76,022	98,830
Per Cent of Purchases remaining in Inventory	10.1%	12.0%

A tendency toward high inventory to purchases ratio shown above indicates overbuying for present manufacturing requirements. A relatively small inventory or a tendency toward a low inventory ratio would indicate a "hand-to-mouth" buying policy. The report should be used in connection with the distribution of the manufacturing outlay report (Figure 32) and the turnover report, which shows the rate of turnover of the raw materials.

The same analysis could be made in a commercial concern where it is desired to check on purchasing policies.

Ratio of Manufacturing Costs to Finished Goods Inventory.—A similar study often used in conjunction with the above report, where no budget system is in operation, is one that shows the ratio of total manufacturing costs to the finished goods inventory. This latter report given below shows the correlation between the sales requirements and the production quotas. A tendency toward an increasing ratio of inventories of completed goods to total manufacturing costs would indicate losses in the expenses incidental to inventory carrying and the tying up of unnecessary values in inventories; a decreasing ratio would show savings in these costs and a lessened credit strain required for carrying finished goods. The report should be used in connection with the turnover of the inventory of finished goods report. A closer check upon inventory requirements is to be found in budget reports (see Chapter XXI) where such a system is used.

This report to be most effective should be issued weekly, monthly, or quarterly at the latest to detect tendencies in the over-or-under accumulation of finished goods.

NORTHERN LIME COMPANY

RATIO OF MANUFACTURING COSTS TO FINAL FINISHED GOODS INVENTORY

	1925	1926	1927
Manufacturing Cost	$293,970	$328,025	$322,480
Finished Goods, December 31	22,750	17,850	5,180
Ratio of Manufacturing Costs to Inventory	12.9 to 1	18.4 to 1	62.3 to 1

Ratio of Initial Inventory of Finished Goods to Sales Requirements.—The ratio of the initial inventory of finished goods to sales requirements for the first month gives a secondary check on the condition of inventory quotas. The report below shows the amount of goods on hand available for the sales needs for the next month. If compiled weekly or monthly the report would serve as a type of budget control. If based on the annual or semi-annual statements, it would serve as a check on the requirements of inventories at opening dates.

NORTHERN LIME COMPANY

RATIO OF INITIAL INVENTORY OF FINISHED GOODS TO SALES REQUIREMENTS

	1925	1926	1927
Cost of Sales	$288,595	$325,425	$330,150
Average Monthly cost of Sales	24,049	27,118	27,512
Inventory Finished Goods, January 1	25,375	22,750	17,850
Per Cent of Average Monthly Requirements in Initial Inventory	105.5%	83.8%	64.9%

Trends Shown by Index Numbers.[2]—A very useful analysis of the trends of sales costs and expenses may be made by showing the first or base year in actual amounts and the subsequent years as per cents on the base year as shown in the case below. It shows at a glance the tendency of items, but, of course, fails to identify the cause for variations in actual amounts. (See statement on page 286.)

Operating Reports for Commercial Concerns.—A current report for checking the income, expenses, and departmental efficiency of a commercial concern is shown in Figure 33. The

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[2] For a full treatment of trends shown by index numbers, see Stephen Gilman, Analyzing Financial Statements.

Eastern Metal Products Company

Profit and Loss Statement Showing Trends in Index Numbers

	1925	1926	1927	1928
Sales	$250,000	104	100	92
Cost of Sales	200,000	105	97	87
Gross Profit	50,000	100	110	110
Selling Expenses	23,500	105	113	103
Trading Profit	26,500	95	107	116
Administrative Expenses	14,000	104	92	97
Operating Profit	12,500	85	124	136
Financial Expenses	2,500	116	80	100
Net Profit for Period	$ 10,000	77	135	146

Manufacturing Statement Trends in Index Numbers

	1925	1926	1927	1928
Raw Materials Used	$125,000	104	96	88
Direct Labor	40,000	105	87	75
Total Direct Costs	165,000	104	94	85
Indirect Labor	20,000	105	100	90
Power Costs	8,000	125	112	106
Depreciation	5,000	100	160	140
Insurance and Miscellaneous	2,000	100	150	75
Total Burden	$ 35,000	108	114	100
Total Manufacturing Costs and Cost of Sales	$200,000	105	97	87

report should be issued monthly in order to be of greatest value as a guide to the managerial staff. It shows net sales, cost of sales, gross profit, salaries, wages of clerks and helpers, advertising, allotted overhead, total expenses, net departmental

Departments	Fiscal Period 19...	Net Sales	Cost of Sales	Gross Profit	Salaries	Wages of Clerks and Helpers	Advertising	Allotted Overhead	Total Expenses	Net Dept. Profit	Dept. Capital Used	Profit Rate on Dept. Capital	Turnover Inventory	Ratio Sales to Dept. Capital
Dry Goods	Present Month													
	This Month Last Year													
	Total to Date													
Ladies' Ready-to-Wear	Present Month													
	This Month Last Year													
	Total to Date													
Men's Furnishings	Present Month													
	This Month Last Year													
	Total to Date													
Shoes	Present Month													
	This Month Last Year													
	Total to Date													
Home Furnishings	Present Month													
	This Month Last Year													
	Total to Date													
Hardware and Crockery	Present Month													
	This Month Last Year													
	Total to Date													
Grocery	Present Month													
	This Month Last Year													
	Total to Date													
Lunchroom	Present Month													
	This Month Last Year													
	Total to Date													
Toys	Present Month													
	This Month Last Year													
	Total to Date													
Other Departments	Present Month													
	This Month Last Year													
	Total to Date													
Total All Departments	Present Month													
	This Month Last Year													
	Total to Date													

Figure 33. Current Operating Report for a Department Store—Showing Net Profit for Each Department

profit, total capital invested in department, the net profit rate on capital invested, turnover of department inventory, and ratio of sales to invested department capital.

Supplementary reports should also be drawn up that show sales and profits per sales person, and sales by lines of goods handled. Standards should be set up wherever possible to cover the work of clerks and helpers in order to aid in measuring their efficiency.[3] The introduction of the figure of the capital invested in each department and the rate of net profit made on these invested values gives management a final check on the relative productivity of each department. The turnover figure and the ratio of sales to departmental capital give in summary form a check upon the tendencies in merchandise stock in the department (reserve stock included) and the tendencies in sales efficiency.

The general plan may be adopted by any sized institution where distinctive departments are organized. The reports, however, do not function in any way as a substitute for budgetary control.

Ultimate Causes of Operating Losses.—The ultimate control over many operating and financial costs in both manufacturing and commercial concerns as stated previously can be found in data that have no direct connection with the financial statements. The comparative profit and loss statement and manufacturing statement, analyzed to show causes for variations in profits, can be used chiefly as starting points in a more exhaustive search for the underlying causes of inefficiency in operating conditions. In some particular cases when used by small concerns these statements can be employed directly as standards for checking current performance and in prescribing immediate remedies without further investigation into shop, plant, or personnel conditions. Especially is this true where

there exists a notable direct relationship between expense items and sales volume.[4]

Operating Standards.—In other cases where operations are more complex, and still in others where there exists no direct relationship between physical output and total costs, a system of elaborate secondary statistical reports is necessary to properly interpret the immediate causes for the disturbing factors that upset the operating or financial equilibrium. For example, it may be found that the office expenses, either in relationship to sales, or as changes in absolute amounts, have become "out of line." No criteria exist in the operating statements that will in any way show if the fact of being "out of line," or a certain amount or per cent ahead of or behind last year's expenses, has any economic significance.

The comparative statement merely indicates the fact of variation or irregularity, measured against sales or previous expenses. It merely calls attention to the need for investigation; it does not guarantee that the performance of previous years is a safe standard to follow. Other examples of the same general type of expense data covering practically every phase of a business could be cited. The office case merely shows an activity that because of the fine division of labor of modern times has become almost a unit by itself, and is related only distantly in an organic way to the general scheme of profit-making.

One problem is common to all such seemingly unrelated business functions, namely, need for standardization, which in the last analysis means the need for measurement of the specific productivity of each element in the business and the assigning to that element a cost allowance that is commensurate with its contributions to profits. The allotting to the various departments and sub-departments of a "proper" expense budget, requires analysis of physical plant and personnel requirements. The measuring of the output against the input of these operating functions requires an analysis of standard performance and the proper cost of that performance. *This is the heart of the problem of control.* Financial and operating statements are insufficient for the purpose. They furnish the story of what has been done; they are quantitative, not qualitative. The beginning of ultimate business control lies in the construction of standards that furnish the basis for qualitative analysis.

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[3] See Moriarty, The Economics of Marketing and Advertising, page 440.

[4] Many concerns investigated by the writer used this plan for control over all expenses in the business. It was especially noted in retail establishments and such concerns as laundries and small factories.

Types of Standards Varying with Local Conditions.—The method of attacking the problem of constructing physical operating standards naturally will vary with the local problems of plant location, traffic conditions, the general labor situation, sales promotion plans, administration organization, financial limitations, etc. Standard performance data, which are often spread before the boards of directors, should be tied logically to the operating reports in such a way that the connection between the current performance and the standard or expected performance is clearly shown.

In a completely organized business these standard records should measure every job, operation, or activity that has pecuniary significance. The sources, for example, are to be found in personnel rating records, machine rates that are the result of time and motion study, standard unit costs, reports on labor turnover, spoilage and breakage and machine repairs, buying data, turnover of lines of goods, the efficiency of certain types of fuel, depreciation rates, and so on without limit. The important point to note here is the need for reports of a type that are sufficient thoroughly to analyze causes to their ultimate source in order that action may be taken to check losses, and to promote successful lines of action.

Use of Trade Statistics.—Can outside data evolved from the experience of other concerns operating under similar conditions or performing like operations, be used as a guide in the making of standards for a given plant, or departments within a concern? Undoubtedly, trade information may be used as guides to departmental procedures and as checks on the performance of functional officers. But the consensus of opinion among comptrollers indicates that such statistics must be used with great care and then only after the plant or department from which the information is borrowed has been thoroughly studied to determine if exact similarities exist.

Exchange of information covering administrative problems is used as aids to control; the statistics of actual performance or the averages secured from all institutions in a trade association are sometimes useful as indicators of what other concerns have been able to accomplish with a given set of conditions or "average" conditions. However, these outside statistics rarely can be taken as unqualified standards for measuring the efficiency of any given plant without adaptation to meet local conditions.

The enumeration of a few of the conditions that exist in concerns operating under "substantially similar conditions" will readily show the reasons why the statistics of unit costs, or departmental performance, etc., cannot be taken as guides for local conditions. They are: the difference in general plant layout and routing systems, size of plant and the division of labor, volume of business done by departments and for the concern as a whole, per cent of capacity at which plants are operating, labor esprit that aids or hinders the installation of efficiency methods, nearness to raw materials, markets and labor supplies, and other such factors that must be taken into account in "standardizing" performance reports of outside plants.

On the other hand, full use should be made of all information that may be used to improve control, whether of local or outside origin; and while the most effective control technique must be evolved within the plant and from local experience, it is necessary to consider the use of proven methods which have been adopted elsewhere and which find universal sanction where conditions are appropriate for their installation.

The most important of the auxiliary measuring and recording devices which are available to management for carrying control technique into operating plants, sales plants, and other departments of a business are: (1) costing systems and efficiency reports; (2) operating and financial budgets; and (3) general internal and external business statistics. The technique for constructing the standards and the procedure for carrying them out will be discussed in subsequent chapters.

CHAPTER XVII

CONTROL OVER OPERATIONS—EFFICIENCY REPORTS

The Operating Statements Viewed as Research Factors.—It is obvious to the casual reader, from the discussion in the previous chapters, that the ordinary financial reports, such as the profit and loss statement, the manufacturing cost statement, and the unit cost report, fail to direct management to the ultimate specific causes of operating and financial difficulties found in the sales field, the shop, and the office. These statements, together with all of the statistical analyses supporting them, are deficient in providing a practical means for carrying analysis to the physical and personnel elements that furnish the real dynamics of cost variation. In short, a serious gap exists between the usual accounting statements which cover general operating-financial conditions, and those statements which should show the ultimate specific causes for those conditions.

The reports of the average bookkeeping department point out general trends and tendencies in operating conditions which make up income and costs, but fail to locate the genesis of change.

However, these statements cannot be overlooked as factors in control mechanics, for in the last analysis they give to management a definite research orientation in the field of internal production, marketing, and administrative conditions, as well as external economic conditions in which the immediate business problems exist.

The present chapter goes into greater detail in explaining why these financial-operating statements do not give the controls needed by management for successfully conducting all business functions. Chapters XVIII to XXI, inclusive, give a suggested outlined plan of reporting and accounting, which answers in part the criticism raised against the present practice. These latter chapters are expressive of a viewpoint held rather broadly by the progressive professional accountants and writers in the field of standard costs and budgetary control practice.

Financial Reports Insufficient for Managerial Control.—A very common conception of accounting service is the rendering of reports that point out the general sphere in which the analysis should be conducted, and from this approach it might be said that accounting passes the burden to some other function, notably research, in locating the ultimate causes for business disturbances affecting the concern in question.

But, should the reports not do more than point to these problems? Management requires specific remedies for complicated business ills, and programs of reform procedures; not a summary of facts gathered from past experience that indicate the need for reform in general. Accounting reports too often point out the general shop problems, but fail, figuratively, to enter the shop with a well-diagnosed case that isolates the elementary problems needing control. The same is true of the reports covering the office department, sales departments, and others.

Many sub-executives, on the other hand, who have line authority over these various functional activities, have tended to look upon the accounting and statistical work largely as narrative reporting which gave a mere pecuniary description of manufacturing, marketing, and financial processes. The technical controls over the operating details are often conducted without the direct aid of the accounting department. The assembling and interpreting of shop and office measurements of efficiencies are left to the various shop foremen, the office manager, and other line and staff officers, with the hope that they will be

able to evolve a satisfactory plan for locating and controlling the cost elements, unreported by the accountant.

Lack of Correlation Between Statistical and Operating Departments.—This condition exists because of the lack of a direct tie-up between the accounting department and the operating departments. The operating reports rendered after the season's work has been completed, tell simply what has been done, and are too "scattered" for shop use. They should be more specific. What portion of the gain or loss was due to change in rates of wages and salaries; to cost of materials and general contract commitments; to the inefficiencies of laborers, processes, machines? How much was due to idle time of workers, machines, and departments? How much of the problem is personnel management; how much is organization? What are the controllable and the uncontrollable factors in the situation? Who are the officers in charge of various activities needing reform?

These are the important things for management to know. Yet many of them are unrevealed in the usual accounting statements which show merely the existence of business problems and tell in a general way where they are to be found. That is the reason the operating statements are called "directional" reports. They furnish to the research engineer a general approach in locating problems in the functional fields into which business is divided; they do not isolate the basic causes for inefficiencies.

What Operating Statements Fail to Show.—We shall now take up an analysis of the operating reports and point out some of the shortcomings inherent in the present-day statements. A comparative profit and loss statement, properly analyzed, normally shows how much the change in net profits from one year to another has been due (1) to changes in volume of sales handled; (2) to changes in the prices of goods sold; (3) to variations in buying and production costs; and (4) to variations in departmental expenses.

Variations in Sales.—The part of the analytical profit and loss statement covering variations in volume of sales and price variations, directs the management's attention to the external field of competition, price levels; to problems of sales quotas by lines of goods, by departments, etc.; to salesmen's efficiencies, etc., as factors to be taken into consideration in the general reckoning of management problems. However, no specific standards, as such, are found in the statements covering these factors, no performance records checked against the standards; in short, no report as to what the reasonable sales expectancies were, and what results were attained.

Cost of Sales.—Control over the purchases of finished goods, as expressed in the financial statements, is limited to the rather simple pronouncement that gains or losses have been made in the changes in the cost of sales during the fiscal year, compared with some previous period's costs or over an average or last year's costs. The comparative profit and loss statements accompanied with the usual statistical analysis by per cents or index numbers or some other general criteria, show the trends of the cost of goods invoiced to the firm, and point out the fact of the contributory nature of the buying function as a causal factor in the current change in net profits. It shows the progressive strength or weakness of this department, as a department; however, it fails to locate, much less quantitatively measure, the ultimate sources of strength or weakness that are inherent in buying operations.

The maker of such statements, in attempting to locate buying problems, commits the serious error of failing to construct proper outside standards for the buyer. In fact, the lack of independent criteria of buying efficiency forces the statistician to fall back on former prices and expenses for his comparisons. There is need for predetermined buying prices, standard

quantities, qualities, handling costs, storage costs, transportation costs, etc., in order to determine accurately whether the buyer, from a cost viewpoint, as measured against these preplanned costs, is efficient or otherwise.

Direct Labor Costs.—Control over direct labor costs in the factory reports, through the use of a per cent of sales method, through a per cent of total manufacturing cost method, through unit cost statistics, or through processing and departmental costs, is inadequate for locating specific causes for losses.

Direct labor costs are found in all producing departments in the factory. For example, in the lime manufacturing business the varied departments of which are characteristic of many manufacturing processes, workers are found in the quarry, the cooperage, the burning, the barreling, and in the shipping departments. All are under separate foremen, and all work under dissimilar conditions. Some of the operations are rated as out-of-door work, and are subject to physical conditions that make for seasonal and daily efficiencies and inefficiencies, some of which are controllable and some uncontrollable. The cooperage work, being somewhat of a mechanical process, can be more nearly standardized and measured than quarry work, yet is subject to wide variations in per man output. The burning and the barreling processes are also measured, and vary less than the other processes because the burning is timed. The same is true of the shipping process.

Yet in the manufacturing statement and in the unit cost report, which show the direct labor in per cent of total production cost or the direct labor cost per unit, or by departments, no reason is given as to why the labor cost varies between periods. No information is available, from these reports, that will show how much of the variation was due to changes in wage rates, labor efficiency per man or per group, or changes due to idle time from daily or seasonal causes. Among these various departments and within the departments themselves the extra efficiency of one group of laborers may offset the inefficiency of another group, or one man's inefficiency may offset another man's productivity. The total direct labor costs may not show variations between periods, yet there may be serious losses running through the plant as a whole, which if located, would result in important savings in production costs.

This criticism is no less true of the plant that makes a great variety of products, and hopes to control labor costs through the use of unit costs or percentages. Take the case of a typical furniture factory where a large number of processes[1] are carried on in a half-dozen departments. A unit cost even for the integral parts of the finished parts that enter into sub-assemblies and of the general assemblies would be of little assistance for adequate control. Labor costs by departments are of but little more value than labor costs for all departments combined for the reason that statistics of this kind do not individualize, do not localize, inefficiencies sufficiently to form a clear basis for action. To know that the direct labor cost of 50 men in one department out of a half-dozen departments in a plant was 10% higher one period compared to a former period, or to an average cost figure, locates a labor cost problem within a smaller operating unit than the entire plant, but it does not give the exact genesis of the increased cost. The same criticism may be made of the cost reports covering indirect labor, with the same conclusion regarding inability of these reports to locate the inefficiencies of facilitating labor. The important element of standards is lacking.

Raw Materials and Supplies.—Raw materials and supplies control probably involves greater difficulties than labor control. In place of numerous laborers who work in many departments and at many processes at different wages, piece rates, and bonuses, we have the problem, in control of materials, of checking scores of different primary and secondary materials used in varying quantities, qualities, and prices, and in many departments. Some of the materials have been previously produced, and are taken currently from stock; others are purchased in the open market.

The change in the per cent or the unit cost for materials is indicative of a change in an infinite variety of combinations that cause losses to be made in manufacturing costs. The making of furniture, for example, requires the use of several types of hard and soft wood cores, veneer, metals and hardware, varnish, alcohol, paint, glue, sandpaper, crating materials, etc. The making of mechanical equipment, such as machinery and automobiles, requires even a greater variety of materials and supplies, in some instances running into the hundreds of items.

In such cases it is obvious that a report giving the cost of materials per unit of product, is of limited use for control over prices paid for the raw materials, change in quality and the quantity used, spoilage, breakage, etc. A more scientific set of measures and standards must be introduced in such cases to identify variations due to these separate cost elements.

In the case of the manufacture of a single product, such as lime or cement, or in the refining of oil, or the production of certain chemicals, paper, etc., using continuous processes, materials control through the use of simple statistics denoting unit or per cent of material cost changes from a previous year, is often sufficient for general control.

However, it leaves unrecorded the exact cause for variation, that is, the amount of loss or gain due to change in material cost prices, quantities used, wastage and spoilage, and quality of material put into the product.

Spoilage, Wastage and Breakage.—Variation in spoilage, wastage, and breakage reports, when expressed in unit terms or in per cents of total manufacturing costs, point out an important source of leaks in production costs. However, the comptroller must locate the source of the spoilage by individual workers, and processes, or departments, in order to place responsibility on the proper person in charge. Back of this must be found the effective causes for waste materials in terms of (1) inefficient labor, which may result from improper labor training, improper handling of machines, or from labor turnover, etc.; (2) inefficient machine conditions, which may result from improper speeds, feeds, tool conditions, or other purely shop conditions; (3) change in the quality of materials or using materials not adapted to the given product or process, etc.

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[1] The separate processes in the making of tables, for example, are as follows: cut off, ripping, glue joining, sticking, face joining, planing, band sawing, turning, trim sawing, boring, shaping, sanding, belt sanding, spindle sanding, hand sanding, assembling, and crating.

The reports should cover work spoiled by individual workers, by groups or classes, by processes or departments and the plant as a whole; also by classes of product, by processes or departments, and by the plant as a whole.

The Problem of Control over Factory Burden Costs.—Those continuing "institutional" or plant expenses that normally bear no direct relationship to the volume or goods produced, must be reduced to more specific and detailed factors which are closer to sources than such comparison as per cent of sales, per cent of total production costs, or burden cost per unit, this month with last month, or this year with last year.[2]

Since these fixed expenses fluctuate only within certain prescribed limits with changes in volume, the variation found in the per unit cost or per cent of burden items between periods, in the main registers the fact of changing volume of output even when no single item is out of line. The plan gives only an attenuated check upon the efficient performance of those officers charged with the administration of the burden factors, such as the personnel department the engineering department, the factory recording and planning, the factory transportation department, the stores department, the power, heat and light department, factory superintendence, general facilitating labor, plant insurance, depreciation, taxes, rent, etc.

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[2] See typical unit cost report, Figure 36.

Burden Standards and Overhead Costing.—Control over the typical factory burden costs consists of two distinct problems: (1) the construction of standards and performance records that effectively measure the efficiency of the service, i.e., the output of the various elements, such as power, supervision, service, rent, etc., that enter into burden costs; and (2) the proper charging of the burden costs as a whole to product. The first problem falls naturally into the category of budgetary procedure or standardized expenditures;[3] the second problem is one of burden rates as a factor in cost determination and price control.[4]

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[3] For a discussion of budgetary control over overhead expenditures, see Chapter XXII.

[4] The typical plan of applying burden costs to an individual unit article or a "lot" or batch of goods consists of adding to the direct labor and the raw materials cost in the unit, a stated amount that represents the cost of overhead directly chargeable to the product. This added cost for burden may be made on any one of three or four general plans.

The first and most generally used method charges overhead costs on the basis of the number of hours of direct labor allotted to the product. If the overhead cost, in a given case, is $2 for every direct labor hour worked in a department or in the plant, and the number of hours of direct labor charged to a given article be three hours, the burden cost for that piece would be $6. The direct labor and material costs are computed on the basis of the actual labor worked and the materials used per unit.

A second method charges overhead on the basis of labor dollars. For each direct labor dollar expended on the product, a given amount of burden is charged. The rate is derived from the average or last period proportion between the direct labor costs to total burden costs. (For a criticism of these methods of burden application, the reader is referred to a standard treatise on cost accounting.)

A third method employs as a basis for burden charge the materials used in the article. For every dollar of materials used an amount of overhead is applied. The rate of the charge is based on the average or last period proportion between the materials used (cost) and the total burden cost. Other modifications of these methods are sometimes used, chief of which are: the machine-hour and the production-center plan.

Under the machine-hour method, the cost per hour of running each unit of equipment is worked out on the basis of time. The depreciation, tax, insurance, repair, supervision, etc., cost is computed for the machine in question. To this hourly "occupancy" cost is added the hourly cost of power consumed. In some instances, a "supplementary overhead" cost is added. This charge provides for the general plant overhead; an expense not cov-

The budget aspect of burden control runs through all service departments. The problem of the proper amount of input to secure a given amount of output, carries to the plant, the office, the stores, the personnel department, the transportation plant, the engineering department, and all auxiliary functions that aid production. The inefficiency of one of these groups may offset the efficiency of another; yet in the usual manufacturing statement, this condition is submerged in the figure of per unit burden costs and percentages.

Power, Heat, and Light Costs.—In many recording and measuring plants, these costs are treated as separate functions in costing, and are not grouped with the burden department, because of the close connection between power costs and volume of production. Power costs are made up of a large number of separate items such as plant, firemen's, engineers', electricians', and helpers' wages; coal, oil, waste, and miscellaneous maintenance expenses; repairs, depreciation costs, insurance, and in some cases the allotted overhead costs applicable to the power, heat, and light department. A high degree of control over this miscellaneous group of costs, either through a showing of a per unit cost for power, or per cent of power cost to total manufacturing cost, or a dollar variation in production costs is impossible.

Power costs included in an hourly burden rate per machine, as so much per horsepower, or as a cost by departments and translated into unit costs and per cent of manufacturing costs, are useful data for directing the research engineer, as these data show the general trend of power plant costs as a whole. Complete control, however, must carry the analysis further, to the

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ered by the "occupancy" cost. It embraces general supervision, general taxes, general insurance, general services, department costs, etc.

The production center plan follows the machine-hour plan in all details, except that a group of similar or related machines instead of a single machine are costed on an hourly basis. A supplementary rate is also used for charging to the production center its proportion of the general plant overhead.

question of fuel efficiency, changes in fuel costs or rates, wages of engineers, foremen, helpers, and in some cases to the variation in the efficiency of the power generation and transmission system.

Where power and light costs are buried in the total of burden rates and allotted on a labor hour or labor cost basis, identity of these specific variants is lost beyond recovery.

Insurance Costs.—Insurance cost control through a per cent or unit cost, or merged with total burden costs, should be supplemented with a more detailed report showing changing property values, extent of coverage, rate changes, etc.[5] High or low insurance costs per unit of output may simply register changing volume of output, but would give only a rather loose hold upon efficient insurance protection and standard insurance costs.

Taxes, Depreciation, Rent, etc.—These costs are considered "non-controllable" from an administrative standpoint, in that the rates are beyond administrative veto power. Efficiency is not a problem of this group of cost items and hence is not placed on a "service" basis. Depreciation rates may be reduced to volume of output through a change from a flat yearly rate to a service hour or output basis,[6] in which case the unit cost for depreciation may be ascertained directly from machines or equipment groups rates. This would leave the depreciation for the general plant to be recorded through the factory burden cost report.

Idle Time Losses.—Costs occasioned by idleness of individual laborers, of groups of workers or departments, of machines, groups of equipment, or of departments, are not featured in many manufacturing statements or unit cost reports. In many factory reports this important element, which may be the greatest single factor in a given plant causing abnormally high costs, is practically unrecorded as a cost element. Idle labor time is submerged in the total labor costs and shown as an unidentified element with the per unit or per cent labor costs. No attempt is made in the average report to show the loss that resulted from wage inputs that produced a zero output due to lost time.

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[5] For a statement of the property analysis showing insurance coverage, see page 185.

[6] For a discussion of depreciation rates and the causes of depreciation, see R. B. Kester, Accounting Theory and Practice, Vol. II.

Idle time losses may be the result of poor planning or routing; transportation difficulties in the handling of materials; an insufficient number of laborers for performing all work on time, as required through the division of labor planned for a given factory; an oversupply of laborers within a department which results in overcrowding and idleness.

Idle Equipment.—Scattered idle equipment or idle departments, caused by insufficient volume to fill the plant as a whole or by the over-investment in certain specialized machines that are not fully occupied at any level of production, involve costs that are ignored as separate factors, the same as "idle time" wages. Ordinarily the burden costs are charged to a product on the usual basis (labor hours, labor costs, unit rates, machine rates), whether the equipment or department involved is fully occupied or not. Thus, idle plant costs are submerged in the usual burden costs and not brought to the surface as special elements. Clarity would result if factory reports would show this item separately, not to relieve the product of the idle time expense, but to afford a more complete analysis of all elements that make unit costs, in order that effort may be more successfully directed to those factors that most need improvement.

Variations in Machine or Tool Costs.—Variations in the costs of running machines, sufficient in amount to cause increases or decreases in unit costs, should be handled as separate factors in production control. The efficiency of individual machines, of classes of equipment, such as "batteries" of drop forges or automatic cutting machines, etc., and of the machines in a department as a whole, measured against acceptable standards, should be a part of every efficiency report.

Too often the rating of machines is overlooked as means of identifying ineconomies. The hourly or daily cost of operating each item of equipment, measured against its output in terms of previous or standard costs and outputs, forms the critical measure of the efficiency of the physical operating plant, in all of its integral parts. The usual system of unit costs, or of even departmental costs involving several machines, is too ambiguous for the more exact requirements demanded of modern statistical accounting for individual machines and tools, which today involve such large capital outlay. They do not analyze the specific physical equipment elements which in the last analysis are *per se* the genesis of production difficulties.

The report which shows the specific cause of operating difficulties in the more progressive standard cost systems,[7] actually carries the analysis to the individual machines and equipment throughout the plant, and features the variations in hourly or daily machine efficiencies determined on the basis of actual production. These reports also feature machine idle time costs.

The usual cost system passes over all these important details, in covering tool costs. Losses that run into thousands of dollars annually are overlooked because of the lack of specific detailed reports that locate delinquent performance at its source. The individual machine costs are covered normally in the general factory overhead expenses, such as depreciation of machinery and equipment, heat, power and light costs, tool repairs, insurance costs, rent, etc., allotted to the units produced. Individual machine efficiency as such is practically ignored.

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[7] See G. Charter Harrison, "Working Plans for Standard Costs," *Management Engineering*, July 1922, pages 3-7.

Machine Standards.—Unless a reasonable standard output per machine and per man is definitely known in advance, and unless the actual work done by each is accurately measured, no scientific control can exist. What a machine actually produces checked against what it should produce under a given set of conditions, is a tangible quantitative measure of efficiency of that machine. When applied to each machine of a department and to all parts of the plant, a dependable and usable check is afforded for not only locating "unit" troubles, but also in initiating policies which can effectively remedy defects if they exist. Personal responsibility for the efficient handling of machines and equipment, and responsibility for departmental performance is more easily ascertained under such a system of reporting.

Delinquent Cost Reports.—No less serious than the charge of general ambiguity is the charge of tardiness levelled against the usual cost reports and financial statements. Monthly accounting reports are the exception in business. Seldom do we find a cost report rendered more often than quarterly; in some cases they are semi-annual or annual, a fact which means that the statistical checks on unit or process costs are rendered from three months to one year after the operations have been completed.

"Up-to-dateness" is one of the prime requisites of any system of cost reporting. The question is whether quarterly or even monthly statements are adequate for checking operations, the actual units of which are measured not in fractions of a year or on a yearly basis, but on an hourly basis. To find a leak in costs before it has progressed three or four months is good checking, but it must not be forgotten that there are 1,500 working hours in the double shift in the interval between the dates of the usual quarterly cost reports. These reports are usually not available for 30 days after closing.

During such an interval of time the working conditions or

the plant factors that were responsible for the faulty trends noted in the reports, may have altered to such an extent that the remedial policies planned as correctives are not applicable to the current conditions. Kaleidoscopic production conditions caused by the rapid changes found in the business cycle, soon "get out of hand" if not standardized and measured with frequency. In some instances, where contract production or job lots are completed within the periods of closing, when reports are rendered on the finished product, the statements of unit costs are little more than post mortems, informing management that operations in the past have been unsuccessful, and that the methods followed in producing goods, now sold and gone from the plant, were bad.

If substantially similar operating conditions exist in the plant, and if the product be unaltered in specifications, and if the same volume of production be maintained, the information contained in such reports, late as they usually are at the time of rendition, undoubtedly possesses value as warning signs, indicating that wastes exist at some point in the plant, the exact location and duration of which are not precisely shown.

Modern scientific management calls for the supplanting of the post mortem reports on unit costs, processing costs, per cent of labor, materials and burden costs, with daily efficiency reports that give up-to-the-minute qualitative and quantitative data on every economic factor in production.

Conclusions.—The weaknesses of the usual system of cost finding, to summarize broadly, are three: first, a lack of standards that give an index of the elementary factors of costs; second, a lack of records that give an index of the variation of the elementary factors from the accepted standards; and third, the untimeliness of the reports themselves, which allows the continuance of unprofitable processing methods, the keeping of inefficient laborers on the payroll, the continuance of wastage and breakage of materials, the existence of unidentified idle time of laborers, equipment and plant, the continuance of inefficient power generation and transmission conditions, and scores of other factory and administrative conditions, for an indeterminate period of time.

CHAPTER XVIII

CONTROL OVER OPERATIONS—EFFICIENCY REPORTS (CONTINUED)

Efficiency Reports Deal with the Dynamics of Change.—Modern accounting system installations in plants producing standardized products, where operations are repeated with a fair degree of regularity, have gone so far as to modify the systems, and especially cost reports, to the extent that they are no longer historical narrations, but reports on current performance checked against predetermined (standards) engineering costs that were worked out in advance of the actual starting of production. This has practically meant the "scrapping" of the old cost systems in some cases.[1] In place of post mortem reports showing last month's or last quarter's costs with the previous month's or quarter's costs, or last period compared with the same period a year ago, we find a system of predetermined costs worked out according to engineering specifications and based upon scientifically attainable standards. These reports give a daily, or weekly statement, which focuses attention on actual costs, but more important, on what the costs should have been and the detailed reasons for the variation from standard or specification costs.

In those plants that have relatively stable producing conditions, and this includes factories of the job shop type where the product changes frequently in design and specifications, the "variation from standard costs" reports locate the source of trouble, almost as soon as it has occurred; hence, give management a definite program for working out such problems as require solution.

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[1] See Year Book 1923, 1924, 1925, National Association of Cost Accountants.

The statistical unit or processing cost reports, which are used where plant conditions do not warrant the use of standard or specification costs, or where a standard cost system has not been installed, tell where troubles existed in past operations. They point out the general field in which cost problems were to be found. For example, they show trends of labor, materials, power, and burden costs, and thereby furnish an indicator of danger in these respective fields in the period covered by the statements.

On the other hand, the efficiency reports, under a standard cost system, carry the analysis further into the fields of labor costs, materials costs, etc., and tell management definitely what there is about the labor problem, the materials problem, and factory expense problem within the plant, affecting production conditions, that needs immediate attention. They thus deal with the ultimate causal factors—the dynamics of change in production conditions that finally are reflected in the trend reports and statistical statements.

Functional Responsibilities Indicated by Efficiency Reports.—This system of standard costs has been carried into the selling, administrative, and financial fields as well. Through the mediation of the comptroller, the actual detailed shop and office conditions are brought to management, not for regrets over conditions past and gone, but for current daily review and immediate executive action on daily happenings at the time they actually occur. Thus the records function is expanded to include more than the conventional financial data appearing in the cost ledger and the general ledger. Reports that previously have been reserved largely for shop and office consideration in controlling plant operations, are incorporated into the general system of administrative reports, the ultimate purposes of which are: first, to evolve a system of scientific rating on subordinate executives, such as sales managers, works managers, foremen, superintendents, and administrative officers, in order to measure their productivity and hence to rate them in terms of their efficiency; second, to aid these same officers in discharging their responsibilities.

The comptroller as a staff member, working with the functional officers in reducing sales, office and shop conditions to workable standards, and in securing performance data from the cost clerks and others, is placed in a strategic position in formulating definite relief programs for the less well-informed foremen and workers in solving their problems.

Narrative Accounting Reports.—By contrasting the usual "historical" profit and loss statement and cost report, with an efficiency report, the essential differences in form and content may be noted and the relative values of the statements from a control standpoint may be more carefully appraised.

The narrative report of the Hercules Production Company (Figure 34) is a typical operating statement of a manufacturing concern. The analytical-control factors found in this report, made up without reference to previous operating standards, consist wholly of a direct comparison of the current period figures of income and expense with the past year's.

Operating Reports Historical.—In many concerns which do not have accurate forecasting plans based upon scientific standards and records, statements of this type furnish the principal element of statistical controls supplied by the accounting department. Such reforms as are instituted in the shop or office, as stated previously, are often based on rule of thumb, conventional practices unrelated to any system of critical measures. From the shop angle, such statements are wellnigh meaningless because they suggest no system of approach in departmental reform movements. This explains in part the lack of esteem in which accounting is sometimes held by sub-executives, and furnishes a reason why the uncritical shop and office precedents, and conventional practices, have such a hold upon business at the present time. No leverage exists

HERCULES PRODUCTION COMPANY
EXHIBIT "A"—PROFIT AND LOSS STATEMENT
Month ending December 31, 1927

	Dept. 1	Dept. 2	Dept. 3	Totals for Month	Per Cent
Sales	$18,851.30	$20,125.75	$15,439.60	$54,416.65	100.00
Cost of Sales	15,275.00	18,712.50	13,319.75	47,307.25	86.94
Gross Profit	$ 3,576.30	$ 1,413.25	$ 2,119.85	7,109.40	13.06
Selling Expenses			2,513.65		4.62
General Expenses			965.40		1.77
Financial Expenses			897.50	4,376.55	1.65
Operating Profit				2,732.85	5.02
Extraneous Income				778.50	1.43
Net Profit for Period				$ 3,511.35	6.45

	Totals to Date	Totals to Date Last Year	This Month	This Month Last Year
Sales	$185,733.60	$201,312.75	$54,416.65	$59,731.80
Cost of Sales	140,328.40	150,101.65	47,307.25	49,615.75
Gross Profit	$ 45,405.20	$ 51,211.10	$ 7,109.40	$10,116.05
Selling Expenses	20,189.70	21,315.65	2,513.65	2,647.85
General Expenses	7,326.85	8,383.40	965.40	1,392.95
Financial Expenses	4,973.60	5,275.95	897.50	1,052.30
Total Operating Expense	$ 32,490.15	$ 34,975.00	$ 4,376.55	$ 5,093.10
Operating Profit	12,915.05	16,236.10	2,732.85	5,022.95
Extraneous Profit	3,742.75	3,816.40	778.50	1,642.75
Net Profit for Period	$ 16,657.80	$ 20,052.50	$ 3,511.35	$ 6,665.70

Figure 34. Statement of Income and Expenses without Standards or Budgets

in reports of the historical type for the removal of the impediments foisted upon a concern from outside factors, such as seniority rules, conventional rates of pay, efficiency ratings, hours of employment, shop practice, etc.

The information found in this statement is historical—what happened during the past fiscal periods. Predetermined costs and departmental standards are absent. Causes for variations from an acceptable norm, if indeed the manufacturer has a normal operating cost for varying rates of production by lines of goods or departments, are absent.

Measurements of departmental efficiencies, ratings of foremen, localization of lost time and lost motion, controllable and uncontrollable costs, likewise are unnoted.

Efficiency Report Forms.—Figure 35 represents in summary form the efficiency statement of the Hercules Production Company. This report shows standard and actual sales for all departments; standard and actual cost of sales; standard and actual selling, administrative and financial expenses; standard and actual extraneous or outside income.

Sales expectancies in terms of attainable volumes form the basis of control over sales, purchases or production quotas, and hence over production procedure. Standard costs form the basis of control over the distribution of the manufacturing outlay for materials, factory supplies, wages, plant, and equipment service. These operating standards set the limits for economical outlay and furnish a daily guide for the performance of the personnel and physical equipment.

Actual sales of the Hercules Production Company, by salesmen and territories in this standard report (Figure 35), show a decline of only $708.90 from the expected volume. The sales budget will [2] locate the discrepancy. In the sales budget, values are assigned to all of the internal and external contributory factors involved in the changes in sales volume. Variation in

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[2] The technique for the formulation of the sales and departmental expenses budgets will be discussed in Chapters XXI and XXII.

Hercules Production Company
Exhibit "A"—Schedule 1
Standard and Actual Sales, Costs and Expenses
Month ending December 31, 1927

	Standard	Actual	Differences
1. Sales:			
Dept. 1	$18,375.50	$18,851.30	$ 475.80
Dept. 2	20,429.25	20,125.75	303.50*
Dept. 3	16,320.80	15,439.60	881.20*
	$55,125.55	$54,416.65	$ 708.90*
2. Cost of Sales:			
Dept. 1	13,281.25	15,275.00	1,993.75
Dept. 2	17,658.25	18,712.50	1,054.25
Dept. 3	12,550.30	13,319.75	769.45
	$43,489.80	$47,307.25	$3,817.45
3. Gross Trading Profit:			
Dept. 1	5,094.25	3,576.30	1,517.95*
Dept. 2	2,771.00	1,413.25	1,357.75*
Dept. 3	3,770.50	2,119.85	1,650.65*
	$11,635.75	$ 7,109.40	$4,526.35*
4. Selling Expenses	2,078.20	2,513.65	435.45
5. General Expenses	810.40	965.40	155.00
6. Financial Expenses	714.75	897.50	182.75
Total Expenses	$ 3,603.35	$ 4,376.55	$ 773.20
7. Net Profit	8,032.40	2,732.85	5,299.55*
8. Extraneous Income	250.00	778.50	528.50
9. Net Gain for Period	$ 8,282.40	$ 3,511.35	$4,771.05*

*Decreases

Figure 35. Statement of Income and Expense with Departmental Standards for Sales, Cost of Sales, Selling Expense, Financial Expense, and Extraneous Income

the cost of sales amounting to $3,817.45 is the largest item that has cut profits and also the most important deviation from standards. A per cent of sales figures may have located the same fact, but under the budget system of reporting the standard costs for the given volume of production is used as a guide for locating absolute losses. No per cent of sales report can possibly give this information.

The departmental expenses of selling, administration, and finance show variations of $435.45, $155, and $182.75, respectively, or a total of $773.20 from the standard expenses. The detailed causes for these deviations are accounted for in the departmental expense budgets which show preplanned costs for these departments on the basis of the volume of sales forecast in the sales budgets.

Narrative Cost Reports.—It is in the cost report that the greatest contrast in reporting is presented. The "summary of production cost" (Figure 36), a form commonly designated as a narrative or historical cost report, features the unit, total, and departmental costs for primary and secondary materials, direct labor and bonus costs, direct departmental machine costs, indirect or general allotted overhead costs, total departmental manufacturing costs, total cumulated departmental manufacturing costs, total good production, total spoiled production, cost per unit by departments, and total cost per unit including previous departments.

Analysis and control here is secured by a process of comparison. However, a comparison of this month's with last month's cost may compare "inefficiencies with inefficiencies." Generally, if no adverse trend is found from the last period's figures in reports of this type, operating conditions are pronounced satisfactory. In some cases it is only when bad conditions grow worse that research is directed into the field where the difficulty lies. Departmental labor costs per unit in one period may be actually 75% of an attainable standard. This

HERCULES PRODUCTION COMPANY
SUMMARY OF PRODUCTION COSTS
Month of ——, 192—

	Dept. 1 Per Unit	Dept. 2 Per Unit	Dept. 3 Per Unit	Total Per Unit
Primary Material				
Secondary Material				
Direct Labor and Bonus Costs				
Total Prime Costs				
Direct Departmental Machine Costs				
Indirect Departmental Manufacturing Expense				
Total Departmental Manufacturing Costs				
Total Cumulated Departmental Manufacturing Costs				
Total Good Production				
Total Spoiled Production				
Cost Per Unit by Departments				
Cost Per Unit Including Previous Departments				

SUPPLEMENTARY COST STATISTICS

	This Month	Last Month	Same Month Last Year	Total to Date	Total to Date Last Year
Total Manufacturing Cost					
Total Cost per Unit					
Total Production					
Total Spoiled Work					
Total Good Production					

Figure 36. A Typical Narrative Cost Report Prior to Installation of the Standard Cost System

inefficiency is overlooked because no standards have been introduced by the engineer-statistician. Labor costs for a second period may register the same unit cost in the same department compared with a previous period and would be pronounced satisfactory by the accounting department, yet be out of line 25%. Such comparative reports are obviously faulty and misleading. They gloss over the inefficiency they are charged with finding.

The existence of incompetent operators, ineffectual production procedures, wastes, and losses are virtual hidden problems, possibly known only in a vague way to those workers directly involved, but wholly unrevealed to management through the reports that are intended normally to first locate and then eliminate such controllable factors.

DEPARTMENT: Number 1 IN UNITS DATE ——, 192—

	Product A	Product B	Product C
Total Production			
Good Production			
Spoiled Work			
Production Transferred to Assembly			
Production Transferred to Finished Stock			

Figure 37. Daily Departmental Production Statement (Without Standards)

A type of supplementary report issued by many accounting departments is found in the Daily Department Production Statement (Figure 37). The main purpose of this narrative report is to check the daily output of each department by products. A section of the report furnishes a check upon daily losses resulting from spoiled work, one of a score of profit destroyers. However, the statement does not locate and report upon the causes of the spoiled work. Here again the accounting department fails to bring to managerial attention the critical elements of cost variation; hence it leaves the shop

Hercules Production Company
Report of Costs by Production Centers
Month of————192——

	Total	General Factory Expense	Store-room	Power Plant	Production Center No. 1	Production Center No. 2	Production Center No. 3	Production Center No. 4
Direct Labor								
Indirect Labor								
Depreciation, Machinery								
Insurance								
Taxes (Local)								
Misc. Factory Expenses								
Direct Dept. Overhead Expense								
Total Direct Dept. Cost								
Distribution—Power Cost to Centers								
Distribution—Storeroom Cost to Centers								
Distribution—General Factory Overhead to Centers								
Total Production Center Costs								
Number Productive Hours								
Production Center Rate per Hour								
Cost per Hour, Last Month								
Cost per Hour, Same Month Last Year								

Figure 38. A Typical Narrative Production Center Report, Prior to Installation of Standard Cost System

operators to their own devices in analyzing troubles and in reforming inefficient practices.

Figure 38 illustrates a report that shows costs by production centers. This narrative report features the hourly operating costs of distinctive producing centers within a department or the plant as a whole. It localizes cost problems but does not standardize the cost of individual elements, and thus fails to register the fact whether a dollar's worth of service is being rendered for a given cost outlay in these centers.

Efficiency Reports Account for Variations from Standard Costs.—We shall now contrast the usual narrative cost reports with the efficiency report covering factory costs of the Hercules Production Company. The summarized efficiency cost report (Figure 39) shows the total actual costs by departments for the month, the engineering standard costs, and the variations from standard. This report shows losses in direct labor costs from standard estimates of $896; indirect labor shows a variation of $129 from standard costs; materials and supplies show a variation of $477 from standard costs; power costs show a variation of $364.35 from standard cost; fixed costs show a variation of $1,247 from standard costs; and miscellaneous factory expenses show a variation of $704.10 from standard.

This report shows the basic causes for the variations in detail in each department. For example, under Direct Labor Costs are shown the specific variations due to (1) increased wages, (2) idle time of operators, (3) inefficiency of operators. Under Indirect Labor are shown the variations due to (1) increased wages, and (2) extra time and overtime. Under Materials and Supplies are shown the variations due to (1) increased prices of materials, (2) increases in materials used, and (3) increase in handling and storage. Under Power Costs are shown the variations due to (1) increased wages, (2) increased fuel and water costs, (3) increased transmission

Hercules Production Company
Exhibit "B"—Summarized Efficiency Cost Report
Month ending December 31, 1927

	Dept. 1	Dept. 2	Dept. 3	Total
Manufacturing Costs:				
Total Actual Costs for Month	$15,275.00	$18,712.50	$13,319.75	$47,307.25
Engineering Stand. Costs	13,281.25	17,658.25	12,550.30	43,489.80
Net Increase* or Decrease	$ 1,993.75*	$ 1,054.25*	$ 769.45*	$ 3,817.45*
Analysis of Causes of Variations from Standard Costs:				Increase* Decrease
1. Losses Due to Variation in Direct Labor Costs (Schedule 1):				
(a) Change in Wages	75.00*	85.50*		160.50*
(b) Idle Time of Operators	125.50*	198.50*	55.00*	379.00*
(c) Inefficiency of Operators	218.75*	27.25*	110.50*	356.50*
	$ 419.25*	$ 311.25*	$ 165.50*	$ 896.00*
2. Losses Due to Variations in Indirect Labor Costs (Schedule 2):				
(a) Change in Wages	75.00*			75.00*
(b) Extra Time and Overtime	20.50*	15.00*	18.50*	54.00*
	$ 95.50*	$ 15.00*	$ 18.50*	$ 129.00*
3. Losses Due to Variations in Materials and Supplies (Schedule 3):				
(a) Change in Prices of Materials	322.50*	150.00	121.75*	294.25*
(b) Change in Materials Used	169.50*	75.00*	63.25*	307.75*
(c) Change in Handling and Storage	75.00	25.00	25.00	125.00
	$ 417.00*	$ 100.00	$ 160.00*	$ 477.00*
4. Losses Due to Variations in Power Costs (Schedule 4):				
(a) Change in Wages	0	0	0	0
(b) Change in Fuel and Water Costs	75.00*	90.00*	14.75*	179.75*
(c) Change in Transmission Costs	20.00*	17.50	19,60*	22.10*
(d) Change in Power Overhead	55.00*	80.00*	27.50*	162.50*
	$ 150.00*	$ 152.50*	$ 61.85*	$ 364.35*
5. Losses Due to Variation in Fixed Costs (Schedule 5):				
(a) Variations in Dept. Burden	253.25*	308.00*	213.75*	775.00*
(b) Variation in Gen. Factory Burden	233.75*	152.50*	85.75*	472.00*
	$ 487.00*	$ 460.50*	$ 299.50*	$ 1,247.00*
6. Miscellaneous Factory Expenses (Schedule 6):				
Spoiled Work	425.00*	215.00*	64.10*	704.10*
Total All Departments	$ 1,993.75*	$ 1,054.25*	$ 769.45*	$ 3,817.45*

Figure 39. Statement Showing the Variation of Actual Production Cost from Standard Costs by Items and by Departments

Hercules Production Company. Exhibit "A"—Schedule 2
Controllable and Non-Controllable Items—Department 1. Month ending December 31, 1927

		CONTROLLABLE LOSSES			NON-CONTROLLABLE LOSSES		
	Fig.	Dept. 1	Dept. 2	Dept. 3	Dept. 1	Dept. 2	Dept. 3
1. DIRECT LABOR:	41						
(a) Increased Wages					$75.00*	$85.50*	
(b) Idle Time of Operators		$125.50*	$198.50*	$55.00*			
(c) Inefficiency of Operators		218.75*	27.25*	110.50*			
		$344.25*	$225.75*	$165.50*	$75.00*	$85.50*	$ 0
2. INDIRECT LABOR:	42						
(a) Increased Wages					75.00*		
(b) Extra Time					20.50*	15.00*	18.50*
		$ 0	$ 0	$ 0	$ 95.50*	$ 15.00*	$ 18.50*
3. MATERIALS AND SUPPLIES:	43						
(a) Increased Price					322.50*	150.00	121.75*
(b) Increased Materials Used		169.50*	75.00*	63.25*			
(c) Increased Handling Costs					75.00	25.00	25.00
		$ 169.50*	$ 75.00*	$ 63.25*	$ 247.50*	$175.00	$ 96.75*
4. POWER COSTS:	44						
(a) Increased Wages					0	0	0
(b) Increased Fuel, Water Power Supplies					75.00*	90.00*	14.75*
(c) Increased Transmission Costs		20.00*	17.50	19.60*			
(d) Increased Overhead					55.00*	80.00*	27.50*
		$ 20.00*	$ 17.50	$ 19.60*	$ 130.00*	$170.00*	$ 42.25*
5. FIXED COSTS:							
(a) Dept. Burden	46				253.25*	308.00*	213.75*
(b) General Burden	47				233.75*	152.50*	85.75*
		$ 0	$ 0	$ 0	$ 487.00*	$460.50*	$ 299.50*
6. MISC. EXPENSES (Spoiled Work)	45	$ 425.00*	$129.50*	$ 13.50*	$ 0	$ 85.50*	$ 50.60*
TOTALS		$ 958.75*	$412.75*	$261.85*	$1,035.00*	$641.50*	$ 507.60*
Dept. 1		958.75*			1,035.00*		
Dept. 2		412.75*			641.50*		
Dept. 3		261.85*			507.60*		
Total Controllable Costs		$1,633.35*					
Total Non-Controllable Costs					$2,184.10*		
Total Controllable and Non-Controllable Costs							$3,817.45*
*Increases.							

Figure 40. Statement Showing Controllable and Non-Controllable Cost Items by Departments

costs, and (4) increased power overhead costs. Under Fixed Costs are shown the variations due to (1) changes in departmental burden costs, and (2) changes in general factory burden. Under Miscellaneous Factory Expenses is shown the variation in spoiled work.

Controllable and Non-Controllable Costs.—In Figure 40 these losses are arranged according to their controllability. During the month for which the report was issued, the production superintendent incurred preventable losses above his quota of $1,633.35. This report measures the degree of success of the superintendent and his foremen in discharging their responsibilities in production.[3]

The non-controllable losses, those beyond the veto power of the functional superintendents, amounted to $2,184.10 for the three departments. This part of the report brings to the attention of management the important connection that exists between such external factors as buying prices of materials, supplies, and prices of general service, and the internal problems of production controls.

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[3] Where the materials, labor, and inspection are under the line control of the stores departments, the personnel departments, and the inspection, respectively, the reports covering the materials used and wages would be made to the head of these departments and not to the production superintendent.

CHAPTER XIX

CONTROL OVER OPERATIONS—EFFICIENCY REPORTS (CONTINUED)

Direct Labor Report.—Efficiency reports applied to the direct labor field, supply the statistical indices of labor cost variations for the entire plant or office. They give the detailed explanations for the cause of labor problems, and thus furnish one of the most important types of source data that can be placed before management in the field of labor control.

In many business institutions labor is the largest single item in production costs. Daily labor reports as a part of the general plan of scientific reporting on manufacturing conditions afford the means of checking the largest single destroyer of profits, practically as soon as the loss occurs. At the same time it places the responsibility for the loss upon the persons in charge. In the most modern plants mistakes in the personnel department are corrected the same day or the day after the report is received.

Figure 41 is an exhibit of the direct labor report of the Hercules Production Company. Exhibit B, Schedule 1, shows the standard units of work, standard time, actual time, standard costs, actual costs and variations, (1) by process or departments, and (2) by foremen in charge.

Schedule (1-a) shows the data that explain the detailed causes of variations due to increased wages by processes and by foremen. It shows actual hours, the number of hours at the standard rate, the number of hours at the increased hourly rate, the increased rate, and the resulting increased cost.

Schedule (1-b) explains the detailed causes of variation due to idle time and slow time. The total "excess" hours, that is,

HERCULES PRODUCTION COMPANY

EXHIBIT "B"—SCHEDULE 1

STANDARD AND ACTUAL DIRECT LABOR COSTS—DEPARTMENT 1

Month ending December 31, 1927

Process	Foreman	Standard Units Produced	Standard Hours	Actual Hours	Standard Costs	Actual Costs	Increase* Decrease
(a) Cutting....	A	10,000	5,000	5,299	$2,500.00	$2,684.50	$184.50*
(b) Trimming..	B	9,500	2,748	2,890	1,374.00	1,445.00	71.00*
(c) Polishing...	C	9,100	2,550	2,756¼	1,530.00	1,693.75	163.75*
		28,600	10,298	10,945¼	$5,404.00	$5,823.25	$419.25*

SCHEDULE (1-A)—VARIATIONS DUE TO INCREASED WAGES

Process	Foreman	Actual Hours	Hours at Stand. Rate	Hours at Inc. Rate	Stand. Rate	Act. Rate	Inc. in Rate	Increased Cost
(a) Cutting....	A	5,299	3,899	1,400	$ .50	$ .52½	$ .02½	$35.00*
(b) Trimming..	B	2,890	2,890		.50	.50		
(c) Polishing...	C	2,756¼	1,156¼	1,600	.60	.62½	.02½	40.00*
		10,945¼	7,945¼	3,000				$75.00*

SCHEDULE (1-B)—VARIATIONS DUE TO IDLE TIME AND SLOW TIME

Process	Foreman	Total Excess Hours	Idle Hours	Slow Time Hours	Standard Rate	Idle Time Costs	Slow Time Costs	Total Lost Time
(a) Cutting....	A	299	91	208	$ .50	$ 45.50	$104.00	$149.50*
(b) Trimming..	B	142	40	102	.50	20.00	51.00	71.00*
(c) Polishing...	C	206¼	100	106¼	.60	60.00	63.75	123.75*
		647¼	231	416¼		$125.50*	$218.75*	$344.25*

SCHEDULE (1-C)—IDLE TIME AND SLOW TIME BY OPERATORS

	Standard Hours	Actual Hours	Idle Time	Slow Time	Rates	Amount
PROCESS ——........ Employee No. ——....						

* Losses

Figure 41. Reports Showing Losses Due to Wage Increases, Idle Time, and Labor Inefficiencies by Departments and Processes—Issued Daily, Weekly, or Monthly

time above standard requirements, is secured by subtracting from the number of actual hours, the number of standard hours. Idle time represents the actual lost motion due to poor planning and poor supervision of men. "Slow" time represents slow motion of the individual operators, which may be due to inefficiency, lack of training, etc. Standard hours in Department 1, computed in advance, amounted to 10,298. The actual hours consumed in the making of the standard quota, amounted to 10,945¼, or a loss of 647¼ hours for the three processes. In the cutting process under the direction of Foreman A, there was an idle time loss of 91 hours, and slow time of 208 hours. At the standard rate these losses amounted to $45.50 and $104, respectively, or a total for the men under this foreman, amounting to $149.50.

In the trimming process, under Foreman B, the total loss from idle time and slow time amounted to $71, while in the polishing process, under Foreman C, the total loss from the two causes amounted to $123.75.

Schedule (1-c) (figures not given) is used to show standard hours, actual hours, idle time, and slow time rates, and total loss by each employee in the cutting department. Similar schedules should be made for each of the departments. These data may also be shown according to operators under their respective foremen.

Piece-Work and Bonus Plans.—Where piece-work is employed, or a combination of day-work and piece-work, the details are slightly altered to cover performance of individual workers under either plan. If bonuses are given under any of the prevalent systems of premium plans, a "normal" or average output per man is taken as a standard from which deviations in actual output are reckoned. Where an operator works part time under both day rates and piece rates, his efficiency is measured according to the predetermined output assigned as standard in all occupations in which he engages during the day or week.[1] Idle time, increased wages, and slow time can be computed in most machine or mechanical processes, whether the pay be on an hourly or on a piece basis.

Labor Reports and General Management.—The daily check on the individual workers affords a control not approximated by many accounting systems today, yet is presumed to be the ultimate purpose of all cost work. Obviously it is of more importance to know what workers are paying their way and making a profit, than to know the tendency of labor costs for a given product over a period of time. Causes for variations in costs in terms of controllable, changeable, labor factors, specifically identified and measured, are primary. This the efficiency report does.

Under such a specific measuring plan carried to the individual laborers, it is impossible for the inefficiency of one group of workers to be lost in the efficiency of another group; or for the slowness of one department to be made up in the speed of another department. A cost system that gives labor costs by the pound, or foot, or barrel, etc., cannot give data for the effective hiring or firing of individual operators, independently of gang boss ratings. Moreover, the reporting of individual and group labor results to central management "headquarters" for third party consideration, where science has an opportunity to assay productivity values, removes arbitrary and prejudicial actions from the hands of the less competent subordinates, and places the work of rating operators in the hands of those who are better qualified to handle administrative details.

Labor Reports and the Personnel Department.—The labor report thus analyzed into the final elements hands a localized problem over to the personnel department for a reconsideration of standards that have been adopted as a measure for a given process. The discovery of inefficiency likewise opens the problem of (1) the definition of standard working conditions that furnish the physical setting for the workmen being measured; (2) the wage plan in vogue as a factor in stimulation and esprit building; (3) the general policy of the education of workers; and (4) the selection of men for particular positions.

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[1] See G. Charter Harrison, Cost Accounting to Aid Production, Ch. IV.

Labor Reports and the Statistical Department.—However, it must be noted that the comptroller has discharged his duty as a staff member at this point, by rendering reliable data that carry the analyses to their statistical sources. He is not charged with the duty of administering the labor policy of the concern in question.

What the labor costs should have been for a particular job, or in a given department, the actual costs, and the detailed reasons for the variation, are the singular features of such work. This labor performance standard projected into the future by the statistical department as a cost determinant, and as a time-motion resultant, is the real contribution made to the field of costing and production control. It affords a means of advance cost, and hence, price computation, current cost computation, and routine efficiency computation in the direct labor field.

Indirect Labor Reports.—Indirect labor standard costs supplants the former unscientific measure where the efficiency of superintendence and foremanship was supposed to be reflected in the statistics that showed the percentage of indirect labor to direct labor. Figure 42 gives a budget covering superintendence and foremanship salaries for the month in terms of standard salary costs, actual costs, and overtime payments. The total increased cost for the month amounted to $95.50; both salaries and overtime costs are normally rated noncontrollable.

Materials Report.—The loss from the materials and supplies (Figure 43) amounting to $417 for the month, resulted from

Hercules Production Company

Exhibit "B"—Schedule 2

Standard and Actual Indirect Labor—Department 1

Period ending December 31, 1927

Superintendents and Foremen	Standard Salaries	Actual Salaries Rate	Increase* Decrease	Overtime Hours	Rate	Amount Increase* Decrease
A..............	$200.00	$220.00	$20.00*	16	$.75	$12.00*
B..............	175.00	185.00	10.00*	4	.60	2.40*
C..............	160.00	185.00	25.00*			
D..............	180.00	190.00	10.00*	10	.56	5.60*
E..............	150.00	160.00	10.00*	1	.50	.50*
	$865.00	$940.00	$75.00*			$20.50*

Figure 42. Report Showing Losses Due to Wage Increase and Overtime for Indirect Labor

Hercules Production Company

Exhibit "B"—Schedule 3

Standard and Actual Material Costs—Department 1

Month ending December 31, 1927

	Actual Weight Used	Standard Price per 100 lb.	Cost at Standard Price	Actual Price per 100 lb.	Actual Cost	Differences Increases* Decreases
1. Variations Due to Price Change:						
Product A-B-C............	64,500#	$ 5.59	$3,605.55	$6.09	$3,928.05	$ 322.50*
2. Variation Due to Excess Use of Materials:	Standard Weight	Actual Weight Used	Excess Weight	Standard Price		
Product A-B-C............	61,467¾#	64,500#	3,032¼#	$5.59		$169.50*
3. Variations Due to Handling and Storage Costs:	Standard	Actual				
Salaries..................	$225.00	$175.00				$ 50.00
Other Costs...............	75.00	50.00				25.00
	$300.00	$225.00				$ 75.00
Total Loss on Materials and Supplies..................						$ 417.00*

Figure 43. Report Showing the Variation in Costs Due to Increased Prices of Materials Used, Excess Use of Materials by Products, and Handling Costs

variations in buying costs, normally rated non-controllable of $322.50;[2] and excess use of materials, rated as controllable, amounting to $169.50. A saving of $75 made in handling costs resulted from a reduction in salaries of $50 and incidental costs $25.

A supplementary report should be made showing changes in buying prices due to the purchase of improved quality of product as well as changes due to advancing prices based on the former quality. The excess use of materials may be further analyzed to show losses due to: (1) defective material; (2) breakage or excess usage of materials by operators; (3) breakage or excess usage by machines or processes; and (4) breakage or excess usage by departments and for the entire plant.

This latter report furnishes a direct guide for locating the preventable losses through a better supervision of the machines by the speed bosses, gang bosses, and tool grinders. Defective materials are chargeable to the buying department and the inspectors of incoming goods. Breakage by operators locates a problem for the personnel department and the gang bosses whose respective duties are to properly select and then train workers for specialized jobs. The emergency use of materials not adapted to a given process, i.e., larger sizes or better qualities than called for in specifications, often locates a weakness in the purchasing program, or a lack of correlation between the sales department and the production department that results in a failure to provide the required stores of semi-fabricated goods well in advance of current production needs. The materials report should be displayed with the spoiled work report (Figure 45).

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[2] Standard cost for materials are figured on the basis of the normal unit requirements at standard cost prices. Any change in prices from standard (estimated buying costs) affects the cost of the quantity purchased. The total weight used figured at standard prices would give the cost at standard rates, and the difference between this and the standard materials cost would represent the added cost for the added materials used, at standard prices. The total poundage used at the actual price gives the total actual costs, from which should be subtracted the pounds used at standard prices in order to derive the variation due to the price change.

Where a separate traffic department is maintained, a standard and actual in-freight and cartage cost report on raw materials would be made. In the reports of the Hercules Production Company, the freight has been charged with the materials.

Heat, Light, and Power Report.—The power report (Figure 44) shows a variation of $150 from standard allotted costs. A supporting schedule of the payroll would indicate the number of employees, the standard wage rates, actual wages and differences, if any. Details of coal and water costs would show: (1) standard coal tonnage and metered water needed for standard steam requirements for power and heat; (2) actual amounts used; (3) rates; and (4) variations from standard costs. Engineering data would reveal inefficiencies in the use of fuel. Variations in use and rates would be worked out where electricity or gas is used. The control over maintenance of the power transmission system would depend upon the organization in the plant.

HERCULES PRODUCTION COMPANY
EXHIBIT "A"—SCHEDULE 4
STANDARD AND ACTUAL POWER COSTS—DEPARTMENT 1
Month ending December 31, 1927

Cost Items	Standard	Actual	Differences Increases* Decreases
1. Salaries and Wages	$350.00	$350.00	
2. Coal and Water Used	235.00	280.00	$45.00*
3. Power Supplies Used	50.00	80.00	30.00*
4. Maintenance Transmission System Wages—Supplies Departmental	125.00	145.00	20.00*
5. Power Plant Overhead, Depreciation, Taxes†	200.50	255.50	55.00*
	$960.50	$1,110.50	$150.00*

† Salaries and wages, fuel and water, power supplies, and power plant overhead are generally not shown in departmental power costs. This portion of the statement is intended to show the type of report made for the power department costs allotted to the departments involved.

Figure 44. Report Showing Standard Power Costs, Actual Costs, and Differences

Where the power generation and transmission is under the line control of the departmental foreman, a budget of these costs based on standard requirements would be made out. It would show standard number of employees, wages, supplies, and incidental costs. The actual costs would show the variation from standard. The same plan would be followed in securing statistical data on power plant and power transmission overhead costs. The principal items under this category would be depreciation, taxes, insurance, etc.

HERCULES PRODUCTION COMPANY
EXHIBIT "B"—SCHEDULE 5
STANDARD AND ACTUAL SPOILED WORK—DEPARTMENT 1
Period ending December 31, 1927

Process	Foremen	Standard Allowance Units	Amount	Actual Spoiled Units	Amount	Difference Units	Differences Increases* Decreases
Cutting	A	160	$145.00	330	$305.40	170	$160.40*
Trimming	B	40	93.60	125	187.20	85	93.60*
Polishing	C	20	37.00	105	208.00	85	171.00*
		220	$275.60	560	$700.60	340	$425.00*

SPOILED WORK BY OPERATORS

Operator No.	Cutting	Trimming	Polishing
2			
3			
6			
20			
etc.			
	$305.40	$187.20	$208.00

Figure 45. Report Showing Variations in Spoiled Work Costs by Processes and Operators

Spoiled work (Figure 45) usually is reported separately. The method of accounting varies according to the type of production procedure. In many cases the materials, labor, and allotted burden are charged to a specific job, or a production center; in others the cost is charged as an overhead item and spread over the plant as any other item.

Special attention should be paid to the spoiled work by departments in order to render a proper accounting for defective work where and when it occurs, so that the proper responsibilities may be assessed.

The spoiled work by operators locates the exact cause for defective work in so far as it may be assessed to the labor factor. A further analysis should be made that would show causes due to (1) latent defects; (2) defects due to machine conditions; and (3) breakage caused by handling.

Departmental Burden Report.—This report shows the "institutional" costs that vary but little between seasons. A listing of the standard departmental burden cost items (see Figure 46) shows the predetermined costs, based in the main on past experience figures. Current variations in rates constitute the principal source of increase or decrease in costs. The excess departmental burden costs of the Hercules Production Company show an increase of $253.25 from standard.

HERCULES PRODUCTION COMPANY
EXHIBIT "B"—SCHEDULE 6
STANDARD AND ACTUAL DEPARTMENTAL BURDEN COSTS—DEPARTMENT 1
Month ending December 31, 1927

Cost Elements	Standard Costs	Actual Costs	Differences Increases* Decreases
1. Superintendence	$ 200.00	$ 225.00	$ 25.00*
2. Depreciation	450.75	475.50	24.75*
3. Insurance	110.50	125.50	15.00*
4. Taxes, Equipment, and Building Dept'al	95.20	95.20	0
5. Maintenance and Repairs	78.50	128.25	49.75*
6. Supplies	42.75	72.00	29.25*
7. Other Costs	96.50	206.00	109.50*
	$1,074.20	$1,327.45	$253.25*

Figure 46. Report Showing the Departmental Standard Overhead Costs, Actual Costs, and Differences

The General Factory Overhead Report.—This is usually called the supplemental burden report. Costs are assessed to a department on the basis of the total labor hours or labor costs.

HERCULES PRODUCTION COMPANY
EXHIBIT "B"—SCHEDULE 7
GENERAL FACTORY OVERHEAD ALLOTTED TO DEPARTMENT NO. 1
Period ending December 31, 1927

Cost Elements	Standard Costs	Actual Costs	Differences Increases* Decreases
1. General Factory Supt. and Staff	$375.60	$ 375.60	
2. Service Departments: Wages and Salaries	220.80	308.75	$ 87.95*
3. Supplies, etc	50.25	125.20	74.95*
4. Depreciation, Taxes, Insur. Plant	147.50	218.35	70.85*
	$794.15	$1,027.90	$233.75*

Figure 47. Report Showing the Allotted Standard Plant Overhead Costs, Actual Costs, and Differences

In some cases the two burden costs are merged and charged to product as a single cost on an hourly basis. Standard burden cost conditions are usually "set" by economic factors beyond the control of management. The standard burden cost report (Figure 47) identifies variations from these factors. Internal physical standards within each department must be relied upon for determining the fact whether a dollar's worth of service is being secured from each dollar invested in service units. This applies particularly to the service departments such as stores, engineering, personnel, etc.

The Cost of Non-Productive Time.—It has been said that the critical element in all production is time—the time of employees; the time during which capital is tied up in plant, machinery, equipment, raw materials and supplies to produce finished goods; and the time of management and administration. The ultimate cost of production, aside from various buying rates for materials, etc., is wholly a function of elapsed time required to process. The market sustains a higher price for products that require a long time to make than for those that require a short time. Complex processes involve a longer period of time, hence are more expensive to conduct than simple processes. Successful management, then, can be judged by how well the time of all factors is employed.

Idle time of laborers, machines, equipment and plant, due to inefficiencies resulting from poor planning, routing and personnel factors, should be distinguished from enforced idleness caused by less than standard production in a single department or the plant as an entirety. Lost time and motion on the job increase the direct costs and a commensurable portion of the burden costs required to turn out a given product compared to a standard cost. Such losses are normally found in the daily work reports of employees, which show the time consumed on a given piece of work and also the elapsed time between jobs or losses due to breakdowns, delays, etc. Wages unaccounted for in poorly supervised departments is another example of operator idle time. "Slow" time is another phase of idle time; it measures the inefficiency of a given worker in his inability to do a given task in standard time.

Then again, in many plants there exists specialized equipment installed to save costs incidental to sending work outside. Such unused equipment carries a higher than average per hour machine cost because of its lesser utilization, which is unduly

increased when a plant is subjected to labor idle time that slows the rate of speed of the entire plant.

Unused Overhead Costs.—The most serious idle time cost naturally arises from slack production. Total costs of production are lower, yet the unit costs are higher because of the unabsorption of a part of the time of plant, equipment, and management. This unused time cost should be emphasized in cost reports. If a plant is running only 75% of standard capacity, one-fourth of the carrying load, and hence one-fourth of the overhead costs, remains unproductive. A full 100% cost is the measure of the "input," and 75% the output, measured in terms of the utilization of that cost. The full expense outlay is incurred whether three-fourths of the plant is occupied or the plant run three-fourths of the time or whether 100% utilization is secured. The unused portion or the unused time is lost time.

It adds to the unit cost of the product made, because the idle time must be absorbed by the smaller number of units actually made. If the total manufacturing outlay be recovered from the consumer, a higher price must be charged. Under many of the older systems of costing, as previously mentioned, the loss resulting from idle time is assessed to the product in a higher burden cost per unit but is unidentified as a separate cost factor. The actual working time which is a lesser number of labor hours than standard is charged with the given total overhead cost.

Under the system of reporting, outlined here, and used rather broadly today, a special feature is made of idle time costs. An example will clear up the method of computing idle time costs. The departmental overhead in a certain plant may be $2,000 per month, based on standard labor hours of 2,000 direct labor or machine hours, or a rate of $1 per hour. If the department employed only 1,500 of the 2,000 hours, the statement for idle time would be as follows:

Total overhead departmental cost	$2,000
Total labor or machine hours	2,000
Rate per hour	$ 1
Actual hours worked	1,500
Idle hours	500
	$2,000
Cost of used hours: 1,500 at $1	$1,500
Cost of idle hours: 500 at $1	500

From these data, the unit cost for idle time can readily be computed. If 5,000 units be made, the cost per unit for idle time would amount to 10 cents per unit. Also the added units of production necessary to absorb this cost element can be readily computed. If the idle time cost for the plant for the month be $500 and the idle time cost per unit of product be 10 cents, an additional output of 5,000 units will be required to remove the loss due to unused plant.

CHAPTER XX

CONTROL OVER COSTS—STANDARD COST ACCOUNTING

Standard Costs Not Uniform Costs.—A standard cost plan should not be confused with a uniform cost system. The movement to standardize the systems of accounts within a given industry or trade has resulted in the adoption of a common classification of accounts, and the use of a more or less uniform type of financial and operating statement, on the part of the firms operating like business plants. Uniform accounting in such instances as the printing trade, lumber dealers, etc., means the use of a substantially similar ledger and statement scheme by association dealers or producers, who use the results for comparative purposes as an aid in controlling local conditions.

Many large wholesale firms have fostered the idea of uniform accounting to introduce order into poorly devised accounting systems used by customers, as an aid in standardizing credit statements.

However, these external statements furnish but little information of use in determining the par in performance of a given operation.

Standard Costs Based on Physical Standards.—Standard costs are usually internally derived. They are postulated upon a certain given volume of production in a given department or the plant as a whole. All of the physical and material requirements to carry on the set volume are scientifically measured in advance. The engineer under whose jurisdiction the construction of plant standards falls, figuratively precedes the product as routed through the various processes. Each machine or processing unit is assigned in advance a given function in the production sequence as required to build up (synthetic process) or break down (analytical process) the product. Definite speeds and feeds are assigned to these machines.

The transportation of the product through the plant is planned in advance. The power required to drive all the machines is computed on the basis of the standard or set production volume. Fuel items, miscellaneous power supplies, engineering wages, and other power costs needed to deliver the power, are worked out on the same basis. Repairs and maintenance of the plant and of all the equipment involved in the production of the product being manufactured, are placed in the budget of costs. Thus standard costs represent the "best practice" attainable in a given local plant operation based on physical standards. Where the system has been recently adopted, the last period's cost, or the best cost for each unit of expense, is often used as a starting point.

Laboratory Tests—Plant Analyses.—Laboratory tests, such as special runs or sample operations, are often made for the sake of obtaining special "plant" measurements. Use is frequently made in these cases of time and motion studies, aimed at securing greater precision in the work of operators. Again, mechanical, electrical, and chemical analyses are often made to ascertain the correct quantities and qualities of materials needed as minimum requirements. These so-called "blueprint" cost figures based on actual machine rates, labor rates, routing and planning, are used in a dual capacity; first, as a standard scheme for estimating the cost of goods to be made on contract specification, and in meeting competition; and, second, as a measure of the performance of machines, laborers, superintendents, etc. Predetermined costs set the upper limits of buying prices for materials and wages of labor, and indicate the quantity and quality of each necessary for profitable production. Overhead allotments are made on the basis of a given normal or standard rate of output.

These costs which are projected into the future as operating guides, naturally are flexible in character in order to meet changing plant and personnel factors which become altered through fundamental economic conditions; measurements which become obsolete are as useless as worn-out equipment.

Standard Cost Accounting.—The accounting for standard costs is very similar to the older systems used for recording factory and commercial costs. Since the elements of expense are not changed by the introduction of a new system of measurements, practically the same classification of accounts is employed. For factory costs the accounts employed are materials, labor, and burden. In commercial costing, the accounts employed are the usual expense groups.

The unique feature found in the standard cost system is the placing of the predetermined costs in the accounts themselves, as guides for comparing the effectiveness of the money outlay allotted to product at the time of incurring the actual expenses. Each account carries two values: (1) the standard cost, and (2) the actual cost.

Thus the system gives all of the actual cost data and the cost of sales as well as the par in performance for the same items. The accounts show the standard and actual unit cost for each operation, such as quarrying, burning, coopering, filling, and storing in lime production; cutting, turning, drilling, sanding, dipping, etc., in furniture manufacturing. These accounts are put under control accounts in the same manner as are the usual factory accounts.

The standard cost accounts for labor, materials, and burden will be briefly outlined to illustrate the principles involved.

Standard Accounting for Materials.[1]—"In the case of Work in Process–Material, there are two sets of columns for both the debit and credit sides—one set headed Actual and the other Standard. The columns headed Actual are the ones employed in the accounting. The columns headed Standard are for the introduction of statistical figures, and these figures do not appear in the accounting.

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[1] The data used for standard accounting for materials, direct labor, and burden were adopted from "Cost Accounting Through the Use of Standards," a bulletin published by the Department of Manufacture, Chamber of

ACCOUNTS PAYABLE

			Jan. 31	Purchases in January (a).....	$1,000

RAW MATERIAL

Jan. 1 31	Raw Material Inv........... Purchases in Jan. (a)........	$2,000 1,000	Jan. 31	Deliveries of Material to Factory (b)..................	$1,600
		$3,000			

WORK IN PROCESS—MATERIAL

		Actual	Standard			Actual	Standard
Jan. 1	Raw Material in Inv.............	$1,650	$1,400	Jan. 31	Material in Production at Standard.		$1,800
31	Receipts of Material from Stores (b)	1,600	1,200		Material in Production Adjusted to Actual (1.25 of standard) (c)....	$2,250	
		$3,250	$2,600				
	Ratio: 3,250/2,600 = 1.25						

COST OF GOODS SOLD

Jan. 31	Material in Production Adjusted to Actual (c)........	$2,250			

Figure 48. Standard Accounts for Materials

"As materials are purchased, they are charged to Raw Material at actual cost. All deliveries of raw material from storeroom to the factory are covered by requisitions, and in the cost department these requisitions are priced through the use of the actual unit costs, as revealed by the perpetual inventory cards, and also at the standard unit values. Furthermore, if the quantities of material delivered are greater or less than the standard quantities for the particular requirements, if these are known, the requisitions show two quantities and there are two extended values; i.e., (1) actual quantities times actual unit costs and (2) standard quantities times standard unit costs.

"Raw Material is credited with the total of the actual values thus obtained and in the diagram the deliveries of material to the factory for the month of January have a total value at cost of $1,600. The standard value is $1,200.

"Referring now to Work in Process–Material, it will be observed that on January 1 the inventory of material in process revealed an actual value of $1,650 and a standard value of $1,400. The inventory values and the values of deliveries from store are totalled and the ratio of actual values to standard values obtained; i.e., the ratio in this case is 1.25.

"During the month of January the factory has produced and shipped to customers a definite number of the company's products, which, priced with respect to material, have a standard value of $1,800.[2] To obtain the corresponding actual value

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Commerce of the United States, Washington, D. C., 1926, pp. 27 to 35 inclusive.

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[2] By way of an explanation, it might be noted that the $1,800 credit to the Materials in Process account (Figure 48) is secured from a physical count of the materials used in the finished product. For example, in the above case, if the number of completed units amounted to 3,600, and the materials cost per unit were 50 cents, the standard cost for materials used in process would be $1,800. However, the actual costs were 125% of standard, as shown by the ratio of the actual buying costs to the standard. This per cent figure applied to the standard cost of materials in process, gives a total of $2,250 as the actual cost. A separate account is sometimes set up to show the variation in materials cost, and the difference, here of $450, charged to profit and loss as a separate cost item.

The actual total cost of sales is readily derived by applying to the standard cost the per cent of variation for each of the items. For example, if the standard materials cost is computed at $2 and the efficiency rates 110% of par, the actual cost for materials would be $2.20. A standard labor cost of $3 with an efficiency rating of 105% would give an actual labor cost of $3.15. A standard burden cost of $3.50 with an efficiency rating of 125% would give an actual cost of $4.375. The standard cost per unit would be $8.50; the actual cost would be $9.725, or a production efficiency of 114.4%.

The ratings would be extended to all laborers, sub-groups, and all laborers in departments and the plant as a whole. The materials ratings would be extended to all materials and supplies used. The burden ratings would be extended to all overhead costs involved in the production of the article being costed.

In any case the actual cost of sales may be computed as soon as the physical count is made and the composite ratings for materials, labor, and burden determined.—(The Author.)

of this delivery it is necessary only to multiply the standard value, $1,800, by the ratio, 1.25, which gives an adjusted actual value of the production of the month of $2,250. This, then, is the amount which is credited to Work in Process–Material, and charged to Cost of Goods Sold.

"Where it is difficult to distinguish between actual and standard quantities it may prove reasonably accurate, for the purpose of accounting control, to assume that the actual quantities delivered are also the standard quantities. However, in such a case it will be very desirable to make constant checks in the factory of the efficiency of use of the material.

"A second plan for control of materials involves the use of a special account which may be entitled Profit and Loss on Materials Used. The procedure is similar to that in the plan above with the exception that the variation between actual values and standard values of materials delivered from the storeroom to the factory is carried to the account, Profit and Loss on Materials Used.

STANDARD ACCOUNTING FOR LABOR

ACCRUED PAYROLL (1)

			Jan. 31	Direct Labor for January (1)	$5,000

WORK IN PROCESS—DIRECT LABOR (2)

		Actual	Standard			Actual	Standard
Jan. 1	Inventory..........	$1,000	$ 800	Jan. 31	Direct Labor in Production at Standard........		$4,000
31	Payroll for Jan. (1)	5,000	4,700		Direct Labor in Production Adjusted to Actual (1.09 of standard)......... (2)	$4,360	
	Ratio: 6,000/5,500 = 1.09	$6,000	$5,500				

COST OF GOODS SOLD (3)

Jan. 31	Labor in Production Adjusted to Actual............. (2)	$4,360			

Figure 49. Standard Accounts for Direct Labor

"The third plan for the control of material under standard costs contemplates that the variations due to unit prices be set aside at the time the material is purchased.

"In the case of the Standard Labor accounts, the costs are carried through Work in Process, Direct Labor, by an adjustment of the standard cost to actual costs in the same way as has been described in the case for raw material." (Figure 49.)

Standard Accounting for Overhead.—In accounting for overhead a budget is prepared for all the costs required to carry the power, depreciation, taxes, etc. These items are computed on the basis of the expected rate of output. This cost is then expressed as a definite rate per labor hour based on the total expected labor hours, also previously computed. For example, in a given department or production center, the expected or standard hours are 775; the budgeted or standard cost is computed at $1,550, or $2 per labor hour. There may be two variations from the predetermined costs, first a greater or less outlay than the budgeted cost, and second, a greater or less number of actual labor hours expended in the production center.

One plan of accounting for the "unused" portion of overhead, as shown in Figure 50, treats of this item as a charge to profit and loss to be taken from the overhead costs and charged as "cost for idle plant" or "unabsorbed overhead." If, in the above case, the total actual hours worked were 665, the "used" or "absorbed" burden would amount to $1,300. The cost for idle plant time would amount to $250, or 125 hours at $2 per hour. That is, the production center was "idling" for 125 hours, while the costs were continuing at the rate of $2 per hour without any product being manufactured to absorb the charge.

The sundry charges to Overhead Expense, amounting to $1,550, is the standard (and here the actual) overhead expense for the scheduled production. The credit of $1,300 to Overhead Expense and the charge to Overhead in Process of the same amount, represents the standard charge for the number of hours during which the production center was actually operating. The charge to the Cost of Goods Sold amounting to $1,400 represents the standard cost of overhead expense

OVERHEAD EXPENSE (1)

		Standard	Actual			
Jan. 31	Miscellaneous..........	$500	$500	Jan. 31	To Overhead in Process—Standard Costs..(1)	$1,300
	Superintendence........	400	400		To Profit and Loss—Idle Plant........(2)	250
	Depreciation, etc.......	650	650			
		$1,550	$1,550			$1,550

OVERHEAD IN PROCESS (2)

Jan. 1	Old Inventory..............	$ 500	Jan. 31	Standard Prod. to Cost of Sales..................(3)	$1,400
31	Overhead Exp. at Standard Rates................(1)	1,300		New Inventory.............	400
		$1,800			$1,800

PROFIT AND LOSS—IDLE PLANT (3)

Jan. 31	Unused Overhead from Overhead Expenses..................(2) Stand. Costs............$1,550 Absorbed Costs.......... 1,300 Unabsorbed............$ 250	$250			

COST OF GOODS SOLD (4)

Jan. 31	Standard Prod. Cost from Overhead in Process...........(3)	$1,400			

Figure 50. Standard Accounts for Overhead Costs—Idle Time

used in processing the completed units. The $250 charged to Profit and Loss–Idle Plant and the credit to Overhead Expense, is the cost of the unused plant. This latter figure becomes a separate charge to costs and is not merged with the other overhead figures.

If the actual expenditures in the above case amounted to

$1,500, and the used or absorbed costs amounted to $1,300, the variation from standard costs ($1,550) would be shown in two accounts. Profit and Loss–Idle Plant would be debited

OVERHEAD EXPENSE (1)

		Standard	Actual			
Jan. 31	Miscellaneous..........	$500	$450	Jan. 31	To Overhead in Process Standard..........(1)	$1,300
	Superintendence........	400	400		To Profit and Loss—Idle Plant........(2)	200
	Depreciation, etc.......	650	650			
		$1,550	$1,500			$1,500

OVERHEAD IN PROCESS (2)

Jan. 1	Old Inventory..............	$500	Jan. 31	Standard Production to Cost of Sales................(3)	$1,400
31	Overhead at Standard Rates ....(1)	1,300		Inventory..................	400
		$1,800			$1,800

PROFIT AND LOSS—IDLE PLANT (3)

Jan. 31	Unused Overhead from Overhead Expenses.......(2) Stand. Costs........$1,550 Absorbed Costs..... 1,300 Unabsorbed........ $250	$250			

PROFIT AND LOSS—OVERHEAD VARIATION (4)

			Jan. 31	Stand. Cost.........$1,550 Actual Cost Note.... 1,500 Overhead Exp. Diff. ....(1) $ 50	$50

COST OF GOODS SOLD (5)

Jan. 31	Overhead in Production..(3)	$1,400			

Figure 51. Standard Accounts for Overhead—Idle Time and Overhead Variation

with $250, the unabsorbed burden, as shown in Figure 50. Profit and Loss–Overhead Variation would be credited with $50, which represents the savings made in the actual expenses compared with the standard. The credit of $1,300 to Overhead Expense, and the charge to Overhead in Process of the same amount, represent the standard charge for the number of hours during which the production center was actually operating as in the former case. The charge to Cost of Goods Sold and the credit to Overhead in Process is also the same. The charge of $250 to Profit and Loss–Idle Plant represents the total loss due to less than standard production. The standard production cost was $1,550, while the absorbed portion amounted to $1,300. The difference in the Overhead Expense has been lowered to $200, a result of the saving in the actual overhead of $50 expense outlay. This account is credited with the difference.

The ledger accounts in Figure 51 show Profit and Loss–Overhead Variation, and Profit and Loss–Idle Plant, in separate accounts.

The journal entries would be as follows:

Dr. Profit and Loss—Idle Time	$250	
Cr. Overhead Expense		$200
Cr. Profit and Loss—Overhead Variation		50

Where the rate of production is ahead of standard rates, an over-absorption of burden results. That means the charging of the standard rate for the actual production. But since the actual production is greater than the scheduled output, the goods produced receive a greater charge per unit for overhead expenses. More overhead is charged than is actually expended. The savings made from the increased output becomes a credit to "Over-Absorbed Burden." This latter account may be credited to profit and loss or used as a reserve to absorb later charges for under-absorption of overhead.

CHAPTER XXI

CONTROL OVER OPERATIONS—BUDGETS

What the Budget Covers.—In Chapters XVII to XIX the usual manufacturing and profit and loss statements were analyzed from a control standpoint. Note was made of the absence of standards in those statements, excepting as previous data were used as guides for current operations. The present chapter points out, in outline form, some of the more important factors involved in the actual construction and operation of budgets as they are used in the business world for analyzing and controlling such factors as: (1) causes for change in volume of sales; (2) causes for change in the cost of finished goods purchased; (3) causes for change in the cost of manufactured goods produced; (4) causes for change in selling and advertising expenses; (5) causes for change in overhead, financial, and operating expenses; (6) financial procedure involved in correlating the money receipts and disbursements for all activities directly and indirectly concerned in (a) the procuring of the net income, and (b) the construction and maintenance of the physical plant and administrative organization.

Standards Applicable to All Business Fields.—The fundamental idea of standards (attainable expectancies) can be carried into all fields where functional officers and sub-executives are placed in charge. What is expected in the way of efficient shop performance, as previously mentioned, is a standard or ideal for the factory superintendent. What is expected in the way of labor and material costs for a given department or a given product, is an ideal or expectancy for gang bosses and purchasing agents. Reasonable expectancies in sales performance, in financial requirements, in administrative and other expenses, likewise can be translated into standards, and checked with the actual performance.

To the individual charged with the responsibility of securing statistical controls over operating and financial conditions, the budget furnishes practically the only medium for bringing together the standard and performance data of the entire business.

The budget thus furnishes a key control over all statistical records that are devised for managerial purposes. It furnishes the medium for planning ahead, by projecting into the future (1) standard or expected income, and (2) the necessary (standard) expenses required to secure the expected income. It likewise furnishes the medium for checking all of the activities that contribute to income and outgo, and assesses the causes of variations in these activities to their proper ultimate sources.

Budget a Super-Coordinator.—Conceived in another manner it furnishes a super-coordinator for the entire business in the fact that preplanning through a budget necessitates the cooperative effort of all functional officers of the business. In addition to being a super-standard for the concern as a unified going concern, the budgetary organization furnishes the machinery for giving the correct "relative emphasis" to all the activities. This tends to check the over-emphasis that is often placed upon a single department, such as advertising, purchasing, transportation, service, etc.

It furnishes a governor to all the work of the functional officers in the fact that it harmonizes (1) sales with purchases of finished goods; (2) sales with production; (3) sales with credit extensions; (4) sales with general and selling expenses, including advertising; (5) sales with sales possibilities as revealed through the market analysis; (6) purchasing of materials, hiring of labor and the incurring of manufacturing expenses with production requirements; (7) purchases of raw materials, finished goods, factory supplies, etc., with inventory requirements; (8) finance and credit needs with the entire program of purchasing, production, and sales.

This consideration of the budget as a super-coordinator naturally raises the question of the organization necessary to carry it out and the relationship between this statistical function and accounting.

Budget Organization.—The first step in starting a budgetary program is to form a budgetary committee. Often this committee is made up of heads of the various departments, the president acting as chairman. In large organizations the treasurer and comptroller are oftentimes members of the budget committee, the comptroller acting as a liaison officer in charge of budget procedures.

The success of the budget program depends upon the completeness with which the organization is carried out. A representative budgetary committee is effective for several reasons. First, it has a cross-section viewpoint of the entire executive personnel. Each department head, being a part of the organization, takes an active part in the determination of the budget quotas. Second, it fixes responsibility. As each officer is held accountable for the operation of the budget in his department, every effort is made by him to reach the goal agreed upon previously as a standard.

Budgeting and Accounting.—For the same reason that it is impossible to control financial solvency without the use of accounting records and statements, so it is impossible to control large-scale operations without the use of well-planned and skillfully executed programs. Budgets supply to management the broad type of control technique over the physical plant and operating factors which balance sheet and profit and loss statements supply over commercial and bank credit factors.

Financial statements furnish the statistical-accounting controls over the extension of credit. The forecasting of income through the use of sales programs, and of operating costs through the use of shop and office standards, furnish the statistical-accounting controls for the handling of company finances.

The accounting department thus becomes an important factor in budgetary work. First, the accounting system is planned in such a way as to render the reports on the functional activities of the business and the officers in charge thereof. Second, the accounting records supply the all-important data covering actual performance for all activities outlined in the budget. Third, the auditing procedure guarantees a high degree of control over the work of these functional officers and sub-executives through internal checks inherent in a well-ordered system of accounting.

Accounting, thus, is the selector and classifier of all quantitative data used for measuring current performance furnished through the ledgers. The motivating force is managerial controls over physical quotas and financial requirements. Organization and research are the means for acquiring control; statistics and accounting are the tools used by management in exercising control.

Budgets and Standards.—Thus it may be seen that budgets are the very essence of standards. They form the statistical materials which summarize all standards and supply the master controls for the business as a whole. The unified statement of expectancies of the concern as a going unit is of itself an expression of standard requirements of management. The expected profit for the period and the anticipated protection of the investment form a basis for judging the effectiveness of the program laid down by the directing heads of the business. Management and administration collectively are charged with maintaining a consistent dividend policy and of keeping the security of the investment at par in terms of solvency and property values.

The most conspicuous standard function of the budget, as previously mentioned, is the use of prefigured estimates of all income and cost items covering the activities of all departments. Since the formal budget contains the listed summary of all statistical expectancies, it is virtually a statement of all standards. Forecasts of expected revenue and the allotment of costs and expenses involved in acquiring the net income form the nucleus of the budget. They are the efficiency checks used for measuring results. Budgeted material costs are the standard costs; budgeted direct labor costs are the standard costs, computed on the basis of rate setting, job analysis, time study, previous costs, best cost, average cost, or on whatever plan is used for prefiguring labor expense per unit of product; budgeted manufacturing expenses are the standard burden rates computed for the planned production program; budgeted selling expenses are the standard selling expenses based on the expected sales quota; budgeted administrative expenses are the standards for the executive and administrative office and general overhead costs, and so on for the remaining expenses.

The budget is the formal statement, placed in the hands of the chief executives through the statistical-accounting department, of the accomplishment of the standardization process. This does not guarantee the scientific quality of the standards used in a given case, nor indicate the extent to which systematization of the planning work has been carried out. But to the degree that standards have been installed, the budget is generally an expression of those standards.

Advantages of Budgets.—These are as follows:

1. Preplanning affords the medium for securing the cooperative work of the two principal functions of business together with the ancillary activities tied thereto, namely, sales and production. Successful merchandizing or production is

predicated upon the procuring of the requisite goods at the time they are needed in such quantity and quality as are demanded in satisfying the trade. If forecasting of sales is carefully done and used as a basis of purchasing or manufacturing, the problem of underproduction with its attendant loss of goodwill, and overproduction with its attendant speculation in commodities, can be largely eliminated. Statistical analysis of sales quotas, as supporting data for the monthly or semiannual or annual profit and loss statement, can give this desired control.

2. The production or purchasing program can be worked out along definite lines, in accordance with the sales requirements. Monthly production quotas can be more accurately planned. All of the factory planning that is directly tied to the functions of time and quantities are susceptible of greater control, through the use of budgets. Standards may be set with greater precision when production quotas are known in advance. All manufacturing or purchasing outlay can be prefigured with greater accuracy.

3. Plant requirements for present and future needs can be planned and executed more scientifically where past sales are carefully analyzed and future trends forecast.

4. Personnel needs for all departments of the business; production, selling, advertising, administration, traffic, finance, etc., can be worked out according to the forecasts of the sales needs.

5. Expense controls are possible through the use of future planning in a way not afforded by any of the less systematic plans. Each departmental expense budget is planned ahead as a standard quota for checking the actual expenditures of money for services and expense supplies. The quotas are based directly on the expected performance in each department and sub-department. Productivity and a reasonable expense outlay needed for the securing of it are determined in advance. All expenditures are based directly on the expected sales volume

and the quantity of work required in each department to handle the primary and secondary sales functions.

6. The financing of all activities in the business that require planning—plant extensions, materials and expense quotas, wages, salaries, selling, advertising, administration, finance costs—must be provided in terms of actual cash income and expenditures. Capital financing and current working capital needs demand budgets. Preplanning the needs for funds calls for the use of the requisite machinery for controlling the funds in such a way that outlay is always covered by sufficient receipts at the time they are needed.

7. Finally, since all activities of any business concern are dependent upon the perfect synchronization of all factors, there is double need for a force that will centralize authority in responsible hands. There is need for a concentric force that will counteract the tendency toward decentralization and independence, inherent in the large-scale production and specialization of modern industry.

Sales Controls

The Problem of Sales Controls.—Sales controls imply the statistical and accounting analyses that give, in terms of immediate causes, full particulars of variations in sales totals between periods. As previously indicated, the reasons for changes in volume of sales are four in number: (1) changes in prices of goods sold; (2) change in the volume by individual salesmen; (3) changes in the volume of goods sold by territory; (4) changes in volume of sales by lines of goods. Sales analyzed by price variants, by salesmen's productivity, by territory and by lines of goods, supply to the comptroller a statistical index of income problems that need be traced only to their ultimate economic sources, to be fully appraised for administrative control purposes.

The analysis of the ordinary profit and loss statement usually proceeds with the assumption that nothing can be done about variations in sales volume. What is written in the annual statements, in many instances, is taken for granted, and no presumptions are raised concerning the causes for loss or gain in sales. Control is not attempted, as no tools are at hand, which suffice for the purpose of analyzing the sales situation into its constituent elements. Sales volume, to the accounting department, in the main, affords the starting point for the statistical analyses of the cost factors directly involved in carrying out the sales function.

Price Variations.—But let us examine some of the possibilities of sales controls that can be supplied from the accounting and statistical records. The first is the question of changes in the price of the goods sold. The entire difference in the sales volume between periods, for a certain line of goods, or in a given territory, may be due to variations in selling prices. Analyses, therefore, should be made wherever possible, showing increases or decreases in sales volume that have resulted directly from price; and if possible the reasons for such change. A list of price change factors would be as follows: (1) price variations by territory; (2) price variations by salesmen; (3) price variations by lines of goods; and (4) price variations by seasons.

Statistical analyses of price changes, covering a large variety of goods handled by department stores, hardware stores, and the like, where the number of types, sizes, color, etc., are great, or in concerns where the lines of goods are changed with frequency, are impossible of collection and too costly for the results obtained. Where the number of products handled are few in number, or where the statistical data of the physical units and unit sales prices are available, price variations can more readily be assembled.

These data might be functionalized for the research department under the following subheads:

1. Price variations due to competition:
    - Foreign
    - Domestic
    - Local
2. Authorized price changes
3. Unauthorized price changes
4. Price variations due to allowance for defective goods, by lines and salesmen

Unauthorized price concessions by salesmen locate a specific problem in personnel management. Price changes resulting from competition are problems for the sales research or the trade extension bureau.

Sales Deductions.—Sales returns and allowances should be given the same general statistical analysis for the purpose of controlling the shipping of unsatisfactory goods. This report may be used as a starting point in the search for latent defects which have passed the inspection and shipping departments. It should be used with the spoiled work report, which in turn tends to check the production and purchasing departments.

The data concerning price changes, sales rebates and allowances, should be turned over to the functional officers directly involved, for such changes as may be necessary to remedy controllable factors. Allowances and rebates on sales figures should be turned over to the inspection department.

Controllability of Sales.—But back of the current measure of sales, lie the standards against which current sales volumes are compared. These standards are the forecasts made previously for the current period. They may have been adopted from past experience figures, or predicted from all available data concerning trade conditions in the various territories served.

Can the sales budget, which in the last analysis is merely sales expectancies in certain territories by classes of goods, be considered a "standard," in the same sense that the term is used in setting rates for machines and operators, or in the same sense that it is used in applying turnover rates for merchandise, the average age of accounts receivable, or the ratio of current assets to current liabilities, etc.? The answer is in the affirmative. Control is largely a question of degree. No activity in any department of a business is subject to absolute control. Some functions are subject to more precise measurements than others.

Some standards are more exact than others, for the same reason that we find varying degrees of exactness in all measurements. Machine rates are based on physical factors most of which can be predicted with a fair degree of accuracy. The rate of work of the operator at the same machine can be predicted to a less certain degree. As social groups are encountered, the question of social attitudes towards institutional phenomena must be measured as in the case of sales forecasts.

In the case of merchandise ratios, a large number of individual and group relationships are encountered, some more difficult of prediction than others. Some individuals and groups, such as employees, are amenable to administrative policies; others are clearly beyond direct controls, and can be reached and controlled only indirectly. For example, customers can be reached through the use of advertising which results in sales, which in turn makes for changes in the merchandise turnover rates.

Sales standards give a degree of control over the sales activities by helping to isolate sales problems and by giving all the selling functions a quantitative rating. The setting of definite sales quotas as a possible work of attainment gives a "standard of performance and accountability." If these quotas are not attained, some satisfactory explanation should be made as to why they were not realized. The analysis of the reasons for non-fulfillment generally locates weakness in the selling organization or the product, and points the way for further

research in internal problems of personnel management, physical plant conditions, or general trade conditions.

Sales Quotas Represent a Guide to All Functions.—Why should the sales standards be placed first in order? In the last analysis the primary purpose of any business institution is the making of profits through the sale of goods or services. The vending of goods, therefore, governs (1) the activities of all other departments in terms of physical quotas; (2) the financial costs of such quotas; and (3) the rate of speed with which activities are carried on. All other plans hinge upon the sales standard for the coming period. No planning can be done intelligently without the setting up of definite, tangible goals; and since all major functional officers and sub-executives must rely upon the sales program for their immediate plans, it is imperative that the quotas of the sales department be drawn up first.

"The operating managers must work with an estimate of sales in mind, so that they may secure the proper sales persons and then train them to meet the needs of the organization. Similarly, the operating officials must anticipate the volume and character of sales to a fairly accurate degree, if they are to employ an economical number of packers, wrappers, telephone operators, delivery men, and the like, and if they are to train these employees into an efficient working force animated with the service ideals of the store, and thoroughly familiar with the operations, processes, procedures, and schedules in retail selling and order buying.

"The treasurer or other officer charged with the responsibility of financing the purchases and expenses of the store must have very definitely in mind the volume of revenue from sales that the store may reasonably expect to receive from week to week and even from day to day. The owners themselves, or the president or general manager as their agent, must carefully study expected sales in investing capital in new divisions or departments of the store, in making additions or extensions of physical plant, or in making decisions concerning new forms of customers' credits."[1]

Formation of Sales Standards.—How are the sales standards constructed? The accounting department, under the supervision of the comptroller or the chief statistician, procures past sales records classified as to salesmen, territory, lines and types of commodities, terms of sales, method of shipment, and any other significant classification that may be useful for preplanning purposes. If this information is not readily available from the ledgers, it may be compiled as statistical information from the original sales data, such as sales invoices, etc.

The information concerning past sales by these functions is useful for two reasons. First, any variations in sales which result in loss or gain in volume compared with previous periods, is a change in volume of definite kinds of goods in certain trade areas, or departments, which are under the supervision of sales managers, who in turn have charge of the work of individual salespeople. If we have accurate knowledge as to where, when, and under whom trade varies, we have at least the statistical reasons why volume changes take place. Second, past sales data are of use as forecasts concerning future possibilities.

Sales Quotas and Market Analysis.—Sales standards, then, have their origins in the past records and in the estimates of future quotas, obtained from all available sources that have a bearing upon the possible future trends in territorial trade conditions. The sales manager endeavors to determine sales expectancies by having thorough surveys made of the territory served by the business from various sources: (1) salesmen, (2) branch houses, (3) dealers, and (4) outside sources.

Salesmen. Traveling salesmen are able very frequently to secure a fund of valuable information from the trade upon which they call. They know their customers personally, and each is in position to gather from them facts and opinions about business conditions and prospects that will have a direct bearing on his possible sales in that particular district. These salesmen should make notes of these facts and report to the sales manager who should tabulate and summarize this information.

Branch Houses. The sales manager should request the manager of each branch house to report to him in detail concerning all the salient business factors in the territory served by his branch, together with his own view as to what volume his firm may expect from his branch in the next fiscal period.

Dealers. It is customary for many business houses to send to their dealers each year, questionnaires requesting pertinent trade information and estimates of the volume that may be expected during the next fiscal year.

Outside Sources. Reports from bankers, trade journals, and statistical services give significant information regarding business conditions for the country as a whole and in specified territory. These may be used to supplement the trade information.

In new territory where it is desirable to learn all trade factors, the research should be directed toward an analysis of local industrial and commercial conditions that contribute to the welfare of dealers and the customers whom they serve. The more detailed the information available on local conditions, the more accurate will be the sales forecasts.

One should ever bear in mind that there are factors outside of the sphere of an enterprise and beyond the control of the executive management that vitally affect a business; for example, cyclones, fires, poor crops, tornadoes, tariff revision, lawsuits, political interference, etc. These the individual cannot control, and when any one of them, or other items within that category, hurt or help his business, they should be taken

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[1] J. O. McKinsey, Budgetary Control, page 57.

	This Year		Increase	Decrease	Actual Last Year	Annual Comparisons		Remarks
	Budget	Actual				Increase	Decrease	
DEPARTMENT 1								
Sales								
Cost of Merchandise Sold								
Gross Profit								
Sales Expenses								
Profit on Sales								
Administrative Expense								
Financial Expense								
Net Profit								
DEPARTMENT 2								

Figure 52. Budget of a Commercial Concern

into account in any comparison made of sales volume, one period with another.

If several products are made and sold of different sizes, grades, colors, and so on, the problem of forecasting becomes more complicated. In this case a detailed analysis of the products, in all their variations, should be made.

Sales Budget Forms.—An example of a key or general budget form may be noted in Figure 52. It shows sales, cost of sales, gross profit, sales expenses, profit on sales, administrative expense, financial expense, and net profit this year; the budget forecast compared with actual, with columns for showing the amount of increase or decrease. It shows the actual for the past period and the difference between periods.

Figure 53 gives an example of standard, actual, and difference in amounts of goods sold by departments, by commodities handled and by salesmen in territories. Supplementary information should be secured concerning comparative performance between periods in territory, by commodities sold, and by salesmen.

Profitable and Unprofitable Lines of Goods.—Before completing the final quotas, it is often necessary to revise portions of the program to fit possible schedules of productions, deliveries, etc., or to adhere to certain fixed policies of the concern. Statistics should be readily available that show the lines of goods that net the greatest profit, in order that proper encouragement may be given to salesmen in pushing the most profitable goods for the firm. Sales costs on various lines of goods in the territories covered should be supplied by the accounting or the statistical departments. Especially should these data be available for groups of commodities that require special consideration in selling and advertising expenses. Lines of goods sold in isolated territory or sparsely populated regions which are costly to reach by salesmen or advertising, and especially where the exact direct costs can be isolated and allocated to the

Period Beginning..............19.. Ending..............19.. **Hercules Production Company**

	BUFFALO				CINCINNATI				CHICAGO			
	Standard	Actual	Difference	%	Standard	Actual	Difference	%	Standard	Actual	Difference	%
SALES (NET) TOTAL..................												
Dept. 1..........................												
Dept. 2..........................												
Dept. 3..........................												
SALES BY COMMODITIES HANDLED:												
Dept. 1 (Physical Units):												
Article A..........................												
Article B..........................												
Article C..........................												
Article D..........................												
Dept. 2 (Physical Units):												
Article E..........................												
Article F..........................												
Article G..........................												
Article H..........................												
Dept. 3 (Physical Units):												
Article I..........................												
Article J..........................												
Article K..........................												
Article L..........................												
Article M..........................												
VOLUME BY SALESMEN:												
Salesman Jones....................												
Salesman White....................												
Salesman Kline....................												
Salesman Robertson................												

Figure 53. Budget for Sales by Territory, Department, Commodities Handled, and Salesmen

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product, are cases in point. Other examples where individual sales costs are desirable, would be for those goods that require excessive costs for shipments (container costs, truckage, etc.), or excessive costs due to special handling, storage, etc. (warehouse costs, interest, insurance, etc.). By eliminating the non-paying and the narrow-margined lines, a greater concentration may be made on the goods that bring a greater net profit.

CHAPTER XXII

CONTROL OVER OPERATIONS—BUDGETS (CONTINUED)

Production Control

The Problem of Standard Cost of Sales.—Standardizing of manufacturing cost of finished goods sold involves two things: (1) control over the cost of production; and (2) control over the physical quantities (quotas) and qualities of goods produced.

The first problem of cost control is related directly to standardization of the entire process of fabrication, from the hiring of labor, the purchase of raw materials and supplies, to the maintenance of the physical plant employed in manufacture. The second statistical control problem is the establishing of quotas, *i. e.,* physical quantities of materials, supplies, labor, power, and plant equipment; and facilitating and measuring devices needed to exactly fulfill requirements of the sales department.

The Production Program.—The production program naturally follows the sales program, when the latter is once established.[1] (See Figure 54 for budget form.) The quantities needed for supplying the sales determine the quantities to manufacture. The seasons of the year when the goods are demanded, set the conditions when they should be manufactured and shipped.

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[1] Conditions will vary with circumstances. In many instances management is faced with the problem of creating a market for a new product. Sales budgets must wait the exploitation of market possibilities before quotas can be planned.

Frequent revisions of the production program are necessary for the reason that many uncontrollable contingencies arise that affect manufacturing considerably and hence affect budget estimates. Some of the conditions not always foreseen and which upset a predetermined plan of operation are: (1) failure of deliveries of raw materials, supplies, etc.; (2) plant, fire, strikes, or serious accidents; (3) plant shutdown for overhauling or new construction; or (4) rearrangement of machinery. But whatever takes place, a monthly comparison at least of the actual against the budget estimates, should be made.

	Estimated This Month	Actual	% Increase Decrease	Last Month	Same Month Last Year	% Increase Decrease	Total to Date This Year	Total to Date Last Year
NET SALES								
COST OF SALES:								
Initial Inventory Finished Goods								
Materials Used								
Direct Labor Costs								
Burden Factory								
Final Inventory Finished Goods								
GROSS TRADING PROFIT								
EXPENSES:								
Sales Salaries								
Sales Commissions								
Sales Traveling Exp.								
Adver. Expenses								
Other Selling Exp.								
Total Selling Exp.								
Office Salaries								
Managers' Salaries								
Office Supplies								
Light, Heat, Janitor Services								
Other Office Exp.								
Total Administrative Expenses								
PROFIT FROM OPERATIONS:								
Financial Expenses								
Financial Income								
Extraneous Profits or Losses								
NET PROFIT OR LOSS FOR PERIOD								
Per Cent Net Profit to Total Capital Used								
No. of Units Produced per Dollar Working Asset								

Figure 54. Current Summary of Production and Sales

Budget Checks Performance.—Many plants keep daily records of performance and costs; these serve a most useful purpose in quickly detecting any abnormal or unusual conditions that arise, thus affording means for a prompt revision of other budget estimates to coincide therewith.

The production or factory budget becomes invaluable as time goes on. By setting standards of operation and checking these standards against actual results, better control over production may be obtained than in any other way.

Figure 55 illustrates a suggested form on which to show: (1) the factory costs, condensed by departments; (2) a comparison of the budgeted figures with the actual; (3) the current month's figures against the actual figures for the month immediately preceding. This form also provides spaces for certain relevant statistical data:

- Number of men employed—
  - This month
  - Last month
- Production (Quantities)—
  - This month
  - Last month

The cost figures prepared for the budget being based on an estimated production, it follows that certain of the costs fluctuate directly with actual production. Hence, to grasp readily the real meaning of the costs, these statistical data are required.

The Function of Planning in Budget Making.—The translating of the sales quotas into production quotas is done in the planning department, which is found in most modern large enterprises. Planning "implies the centralization of control over four elements of the production process. These are (1) the manufacturing orders, (2) the material for these orders, (3) the productive equipment, including machinery, tools, and work places to be used, and (4) the workers.

"Production planning takes these four elements, works with

MONTH OF ....

DEPT.	FACTORY	THIS MONTH					LAST MONTH		PRODUCTION		REMARKS
		No. Men	Budget	Actual	Increase	Decrease	No. Men	Actual	This Month	Last Month	
1.	Productive Labor........										
	Other Labor........										
	Clerical........										
	Materials Used........										
	Supplies and Exp.										
	Repairs........										
	Depreciation, Insurance and Taxes.										
	Other:										
	TOTAL........										
2.	Productive Labor........										
	Other Labor........										
	Clerical........										
	Materials Used........										
	Supplies and Exp.										
	Repairs........										
	Depreciation, Insurance and Taxes.										
	Other:										
	TOTAL........										

Figure 55. Condensed Factory Budget by Departments

them, each in relation to the other, and operates through them in such a manner that the product is turned out in time and by the method that is desired. The orders are the authorization for the performance of the work, and writing them carries with it an implication of coordination with the sales and financial ends of the business. The material comprises every thing upon which work is to be done, whether it be raw stores, worked material, or components which are the product of another plant. The productive equipment comprises all machines, tools, and work places within the factory which are utilized for production purposes, and its control implies its utilization for such productive work as may be deemed best at a given time. The control over workmen is from the standpoint of the man who is to be assigned to the performance of a given task in connection with a particular order. All of these factors are coordinated by the planning department, so that a series of operations, based on needs of the manufacturing orders, upon capacities of equipment and workmen, and upon conditions of material, are developed. These operations are then laid out, supervised and correlated in such a manner that work will proceed through the plant in the smoothest and most orderly fashion. . . .

"To establish a planning department involves taking over from line members of the organization control over (1) when work is to be done, and, within limits, (2) where work is to be done. The extent of control that it may exercise over these phases of the plant's activity must necessarily vary with the plant and product. In determining when and where work is to be done, the planning department performs management functions which have been given definite technical names, the use of which will distinctly clarify any description of the work of the department and eliminate confusion of terminology. These functions are routing, scheduling, and dispatching. Routing includes the planning of where and by whom work shall be done. The routing work of a planning department prescribes the path which work shall follow and the necessary sequence of operations, particularly in building up an assembly product. This work involves such close analysis of facilities that frequently layout is affected. The routing section must have constantly at its disposal all standards that have been set by job study for the operations and for shop methods. Scheduling involves the planning of the amount of work to be done and when each element of the work shall start, or the order of work. This includes planning for the quantity and rate of output of the plant or departments and also the date or order of starting of each unit of work at each station along the route prescribed. Dispatching involves the meeting of schedules by proper utilization of machines, work places, materials, and workers, as designated by the routing. The dispatching unit of the planning department thus includes all persons whose duty it is to see that orders are issued to the shop, that materials are on hand, that tools are provided, job cards issued, and, in general, that all necessary steps are taken to insure that the schedules be properly carried out.

"Planning department organization is directly affected by the nature of product manufactured. The scope of the work and the details of operation in the following industry types must of necessity be different: (1) an assembly industry manufacturing diverse products; (2) an assembly industry manufacturing standard products; (3) a continuous industry manufacturing diverse products; (4) a continuous industry manufacturing standard products; (5) minor variations of these, especially with reference to the length of operations.

"Planning departments vary in organization far more in relation to some such division of industries than they do in relation to products manufactured. Planning problems in clothing and metal-cutting manufacture, or in paper and standard textile manufacture are essentially similar. But the planning for production in a flour mill and in a lock factory have few similarities. In continuous industries manufacturing standard products, the amount of planning work which is necessary is negligible. In assembly industries manufacturing diverse products is found the most involved planning department organization."[2]

Need for Balanced Production Program.—In cases where a great variety of goods are manufactured, it is desirable to have a "complementary commodity group," in order that the production program shall receive due emphasis and balance in all of its parts. The oversale of certain goods would tend to crowd the part of the plant producing that particular line, to the cost of idle plant and equipment used in making the slow moving lines, the result of which naturally would be an increase in the cost of producing the latter line. In the course of time this added cost would tend to be assessed to the faster moving line, with the possible effect of causing a higher price for both. Here is an example of the need for the close cooperation of the sales, production, planning, and cost departments, in carrying out a correlated program of production and sales. The works manager, through the planning and cost departments, should be in a position to supply the exact information relative to plant and equipment needs for each significant commodity group in advance; the unit costs based upon a quantity production, also the time required to produce the articles. For this information all of the data normally supplied by the engineering department as to stores, routing, order of work, machine rates, quantities of skilled and unskilled labor, power, general factory expenses, etc., should be available for estimating purposes. Within reasonable limits, this results in the matching up of the well-balanced production capacity with the sales quotas.

Control Over Production Through Simplification.—One of the most important steps that may be taken in correlating sales and production, is the standardization of designs and the

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[2] Richard H. Lansburgh, Industrial Management, pages 420-423.

elimination of excess types and styles of products. Simplification in output has gained considerable momentum in this country in recent years, as a part of the tendency toward mass production of standard goods. A sales program based upon the plan of handling a smaller variety of goods in each line, simplifies the sales program; it carries with it a simplified program of manufacturing, and it reduces the variety of special materials used and the inventories required to produce the unnecessary styles and qualities. The cost of carrying inventories is cut down, as is the plant space needed for machinery and equipment. Burden costs are reduced because of the lessened interest, depreciation, insurance, etc., on the machinery and buildings. Smaller storage space is required for handling the finished products, for the reason that a lesser number of lines are carried in anticipation of trade needs.

Concentration can be made on the lines carried; hence greater mass production, with all the economies of large-scale production, can be secured. The inevitable result of a simplification program is to increase output per dollar invested in machinery, plant, and payroll. A better quality of goods is produced at lower costs; the saving may be passed on to the consumer in lower prices. A broader market may be reached, which in turn is reflected in greater volume of sales and higher net profits.

The Materials Budget.—The production budget is closely tied up with the purchase budget and inventory controls. The purchasing department wants to know from the production department what its requirements will be in order that the purchasing agent can determine from whom he can buy the raw materials needed at the best prices and terms, and also know that deliveries may be secured at the time they are wanted.

The best prices and terms are often to be had if the seller is informed in advance by the buyer of the probable total quantity that will be needed in a given period, and contracts frequently are made on such a basis. These things upon being known, enable a more accurate estimate of material costs to be put into the budget.

For the use of the buying department it is necessary that the sales requirements, and hence the purchase requirements, be submitted in terms of quantities, qualities, classes, sizes, lengths, etc., which can be translated into the financial needs for the ensuing period. Quantities at definite prices become the buying finance budget. The master buying budget should be thus broken down into detail classes by departments or special units for use of the sub-purchasing agents who are in charge of departmental buying. Arranged according to time requirements, the purchase budget becomes a seasonal director for moving the physical quotas from the vendors to the place where they are needed for display and sales purposes.

The primary problem in setting up purchasing standards, as previously mentioned, is avoiding shortages and the overstocking of goods. The planning ahead for the purpose of filling the sales quotas sets the standards by which the actual results are measured. These standards are not found in the usual comparative profit and loss statements. Last period's purchases and cost of sales may have been correct for the past period. However, no statistical criterion exists to prove it, nor can these data for last year's costs be used to check this year's costs. The heart of the control here lies in the preplanned quotas at specified costs—figures which major functional officers agreed in advance were standard costs for purposes of comparison with the actual results.

Inventory Standards.—An equally important problem in setting purchasing and cost of sales standards is the control which the plan gives over inventories. If the rate of sales is planned in advance, together with the necessary minimum stock for supplying needs, a systematic plan is available for holding the investment in stock-in-trade to the minimum. Excessive

investment in inventory is costly. Knowing in advance what the maximum or minimum inventory should be at any time invariably results in savings. Knowing what to buy, where to buy, how to buy, and when to buy, is very important. Rule-of-thumb plans for the inventory requirements are faulty as compared to a detailed analysis of sales, purchases, and finished goods produced in relation to sales.

Many firms not using the internal checks given through the budget, which controls inventories by sales planning and quota purchases, are forced to rely on past records and unscientific methods for controlling their investments in stock-in-trade. Some concerns use the plan of maintaining a "normal" inventory,[3] which they designate an average inventory of stock, and purchase to keep the amount on hand at this average figure. Still others keep maximum stock figures for various staple lines, which are not to be exceeded.

The adoption of one plan or the other will depend upon the individual case. Whatever plan allows the closest purchasing for the sales needs without resulting in the over-accumulation of goods, or in "short orders" to customers, is the most effective. The plan followed would depend upon the storage facilities, transportation conditions, perishability of the product, credit conditions, discounts allowed, distance to source of supply, general market and trade conditions, etc.

Internal Inventory Checks.—Internal checks on purchases that aid in standardizing purchases and inventories, in accordance with sales production and sales requirements, would consist of (1) records of all outstanding orders by lines of commodities, specifications, etc.; (2) follow-up plans for securing delivery on time; (3) lists of unfilled orders by departments, types of commodities, sellers, and dates of probable shipments.

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[3] For a more complete discussion of this subject see J. O. McKinsey, Managerial Accounting, pages 425-427.

Four methods are commonly used for measuring inventories. They are:

1. Perpetual inventory plan, available in cases where the units are relatively small in number, or comparatively large in value. Records are kept of individual lines of commodities charged to stores; credits are made for quantities requisitioned or sold. The balance at unit prices constitutes the current inventory, which is subject to periodic count for verification.

2. Physical checks of goods on hand are made without the use of records of individual lines. The work of counting goods is usually done infrequently on account of the time and cost involved, and the frequent necessity of practically shutting down operations. Goods are priced at cost or market, whichever is the lowest.

3. The estimated inventory plan is used in cases where the stocks carried are very limited, or where the quantities vary but little and can be readily measured and identified.

The Labor Budget.—Production planning is based directly upon the sales budget; hence, the labor requirements by types and number of workers, in the last analysis, is a demand for labor based directly upon the sales program. Products to be manufactured are analyzed especially for labor requirements, not only for each article made but for separate departments and the plant as a whole. Records that show exact methods for each process and machine are kept by the engineering department. These form the bases of the standard process and machine methods, as well as standard labor rates. In complex processes, or where a great variety of goods are made, the machinery and equipment used for a given run or batch are selected, either from "blue-print" plans, or from past experience data. The labor needs are computed from these machine schedules and routing plans.[4]

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[4] For a more complete discussion of the component parts of the labor standards by functions, departments, processes, and by foremen, see Chapters XVIII and XIX.

In some cases, a different plan is followed by using former labor hours or labor costs required to produce a given volume, and then computing the expected volume, with variations that may arise due to change in design, qualities, etc. Labor costs per unit may also be used for labor requirements and costs for the future output. Where practicable, the standard plan based on time and motion studies, derived as a laboratory study, or on past operations, affords the most accurate forecast and check upon labor performance.

Purposes of Labor Budget.—The purposes of the labor budget are threefold: First, it furnishes a guide for preplanning unit labor costs, a cardinal point of information in figuring total unit costs, and in locating inefficiencies among the working force and the foremen. The formal statement of standard labor expectancies is borrowed in large part from the engineering department or the time study department, where the latter have charge of the setting of rates for the working force.

Second, the detailed information contained in the labor budget aids in determining the efficacy of wage and bonus plans in force.

Third, labor budgets furnish the basis for the factory personnel department in the hiring and training of the requisite laborers for all departments. In many firms, the personnel department works directly with the planning department in outlining the labor program.

Financing Labor Costs.—The treasury department has need for the data contained in the labor budget as a part of the general planning of finances. Expenses for wages must be planned along with other costs. The budget provides the data by amounts and by time. It affords the means of planning the weekly or monthly payroll. Seasonal demands for funds for the payroll can be better planned if a budget for labor needs is known in advance. Requests for additional labor required for increased output are sent to the personnel and finance departments.

Labor Welfare Budget.—Budgets for welfare work likewise are made in advance of the actual carrying out of benefit programs. Some of the more important welfare expenses which are provided in the budget are:[5] (1) employees' service at the plant, such as lunchroom expense, rest room costs, reading room costs, medical and dental inspection costs, hospital service costs, entertainment, gymnasiums, etc., costs; and (2) employee aids not furnished through plant activities, such as educational work, sick leave benefits, contributions to savings funds, old age pensions, etc.

The justification of the outlay for employee aids is clearly a greater productivity on the part of the workers. A healthy, well-cared for individual is a better worker, is more steady in his habits, and hence a better investment than is one of the opposite type.

Estimates may be based upon previous costs with provision for any variations in the plan followed. Standardization is more difficult in the case of welfare costs. However, some measure of the productivity of the outlay should be installed and subjected to analysis the same way as any other production cost. Competition may force the adoption of a welfare outlay of a greater amount than would normally be the case, in which instance the question may be raised as to the desirability of increasing wages or bonuses, which are more directly tied with output, than are the expenditures for indirect employee benefits.

Labor Budget Form.—The budget form for showing the anticipated direct labor costs and the actual performance for

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[5] In some cases this activity is placed upon a separate budget and operated as an outside enterprise. In others it is handled as an integral part of the plant operations.

departments of the plant, or for given orders, is usually made up along the following lines:

1. Expected production, expressed in units and in value terms, for job lot, department, or plant.
2. Actual production following classes in (1).
3. Variations from standards in (1) shown in values and percentages.
4. Expected direct labor cost.
5. Actual costs.
6. Variations in costs from standards, expressed in value terms and per cents.
7. Expected labor cost to total direct costs.
8. Actual labor costs to total direct costs.

The detailed budget report covering indirect labor and superintendence may be made by following the same outline. Detailed causes for variations in indirect labor costs from standards may be analyzed according to the methods explained in Chapter XIX.

Manufacturing Expense Budget.—Standard manufacturing expenses (burden costs) can be preplanned if the production schedules are worked out in advance. As was previously discussed, the proper control over most of the factory "institutional" or overhead costs exists through a system of planned appropriations to meet specific service conditions. (See Figure 56 for form.) Factory burden appropriations are similar to the budgeting of any institutional costs that are not related directly to the output or productive capacity of a plant.

The critical points that must be kept uppermost are: first, the expected work required of the various parts or sub-departments that go to make up the whole of the factory burden; second, the required complement of workers and equipment service needed to produce certain given results; and third, the cost involved in securing production service. This does not imply a method of assessing burden costs to product. The pri-

	Estimated Production in Units	Revisions in Estimates in Units	Actual Production in Units	Amount of Variation in Units	Budget Costs Based on Standard	Revised Budget Costs	Actual Cost or Outlay	Amount of Variation	% of Burden to Total Mfg. Cost	Estimated Unit Burden Costs	Actual Unit Burden Cost	Variation Unit Burden Cost	Variation for Past 3 Periods
INDIRECT LABOR—GENERAL: Superintendent's Salary . . Foremen's Salaries . . . . Helpers' Wages . . . . Electricians' Wages . . . . . . Carpenters' Wages . . . . Inspectors' Wages . . . . Engineers' Salaries . . . . Other:													
FACTORY OFFICE EXPENSES: Office Manager's Salary . . Office Clerks' Wages . . . . . Office Supplies & Tel. . . . Other:													
LIGHT, HEAT, POWER: Water . . . . Fuel . . . . Electric Power (Metered) . Engineers' Salaries . . . . Firemen's Salaries . . . . Power Repair & Main. . . Power Depreciation . . . . . . Light Supplies . . . . Other Costs													
SERVICE DEPARTMENTS: Stores: Salaries, etc. . . . . Transportation Costs . . . . Engineers' Salaries . . . . Routing Clerks . . . . Other Costs													
FACTORY SUPPLIES· Oil, Waste . . . . General Supplies													
DEPRECIATION: Building Factory . . . . Building Stores . . . . Factory Furniture . . . . Factory Equipment . . . . . . Factory Machinery													
INSURANCE: Stores . . . . Building . . . . Machinery & Equipment .													
TAXES													
SPOILED WORK & WASTE MATERIALS													
TOTAL													

Figure 56. Manufacturing Expense Budget

mary problem is the ascertaining of the required "input" to secure a given output of each unit of service or material used in factory overhead costs. What is the load each should carry and what is the expected cost of that load? In short, are the factory burden services doing their required work, and are they rendering a value commensurate with the cost involved? The budgeting of such costs along standard expense lines is the most effective means of controlling them. But such a plan inevitably must follow changes in output within reasonable bounds to be most effective.

Overhead Expense Items.—Service department expenses such as stores, labor, factory, office, plant transportation, factory research, engineering, etc., would not be as great at 75% as at 100% capacity; nor will they be the same on a double shift as a single shift. Power and light cost budgets, involving fuel and water consumption, electric power costs, wages of electricians, engineers, helpers, repairs, wear and tear on dynamos, boilers, power and shafting equipment, etc., can be made out on the basis of the load factors involved in the rate of production and the service requirements.

Secondary factory supplies, such as lubricating oils, sandpaper, waste, brooms, factory containers, etc., likewise can be budgeted on the basis of use. Foremanship, superintendence, and general facilitating labor costs (plumbers, carpenters, steam fitters, inspectors) bear a relationship to the quantity produced which can be forecast and measured. Machine and equipment repair and general maintenance expenses may be based on experience figures, and forecast on the basis of the expected production rate.

Repair costs cannot be standardized to the same degree as can such recurring costs as materials, etc. Appropriations for this work usually are made upon the estimates of the superintendent of maintenance, and cover such costs as wages of repair men and foremen, repair tools, machine shop costs, repair

materials, etc. Control over repair costs rests with the schedules for standard repair jobs and such other physical measurements as may be necessary to assay the efficiency of the elements involved in maintenance costs.

Estimates of maintenance costs for the next period may be secured from previous unit cost figures. Thus, if the previous costs were 2 cents per unit and the production program called for the making of 500,000 units, the budgeted cost for the maintenance department would be $10,000. Machine tool and small tool costs from a budget standpoint are controllable under the same general plan as maintenance and upkeep costs.

Taxes are prefigured on assessable values and are based largely on former costs; insurance on insurable values; budgeted depreciation on former rates for standard production and modified to meet changed conditions from normal, or placed upon a service output or service hourly rate.

The essential idea is the planning ahead for these costs on the most rational basis possible, considering the work to be done, the changing of these projected costs to meet changes in production conditions as they arise, the checking of the actual money outlay against the expected rates, and accounting for the variations in the performance records.

Budgeting ahead for all manufacturing expense items is thus a question of the construction of the standards by means of which the outlay is checked. The total burden as budgeted forms the "standard burden costs" mentioned previously as the base for computing standard burden rates. Since the budgeted costs are based upon the expected volume of production,[6] the unit burden rates can be computed by dividing the total production by the budgeted costs. For example, if the total burden costs are estimated in advance at $325,000, and the estimated units are 600,000, the standard or budgeted burden rate would be ($325,000÷600,000)=$.5416.

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[6] For a more complete discussion of standard burden rates, see Chapters XVII, XVIII, and XIX.

Departmental Burden Expense Budgets.—Budgets prepared for the separate departments or for production centers may be more advantageous than budgets covering the plant as a whole. If departmental burden budgets are prepared by the officers in charge, the responsibility for the expense of a smaller unit than the entire plant can be more readily determined. It isolates difficulties more readily and makes possible required changes in policies.

Departmental burden budgets have an advantage over plant budgets in the fact that the various departments may vary in production. The burden items that are subject to specific controls (such as semi-constant costs) can be more closely correlated with the production in the separate departments, and hence more accurately forecast and checked.

The departmental plan of budgeting the burden items has the disadvantage of not following the functional responsibilities found in the general organization, such as purchases, personnel, plant maintenance, etc. Factory supplies for all departments are generally made through the central purchasing department; hiring of foremen and general helpers through the personnel manager; repairs and renewals through the plant maintenance department; power through the central power and light department. Thus, affective managerial responsibility for these and other activities, the costs of which are assessed to the departments on some arbitrary basis, is secured, not along departmental lines, but along functional lines.

Purposes of Manufacturing Expense Budget.—From the above discussion it may be noted that the purposes of the factory expense budget are five in number. They are: (1) to furnish the data upon which unit standard costs may be based for the factory burden, considering the proposed rate of output; (2) to furnish a program for the sub-executives to follow, in procuring the various factory supplies, indirect labor, etc., and in furnishing the necessary services that aid production, at the time when needed and in the quantities required by the production program; (3) to secure ratings of those in charge of the various services or departments; (4) to plan the money disbursements for the burden outlay, at the time called for by the production program; and (5) to control costs, the desideratum being the holding of expenses to a minimum, consistent with efficient production performance.

The Plant and Equipment Budget.—Every concern operating under a general standard performance scheme, in attempting to synchronize all activities into a harmonious working plan, must inevitably prefigure its plant, equipment, and office construction needs to fit the sales and production programs. If a sales expansion program is contemplated, it will be necessary to plan the production program in terms not only of the needed quotas of goods and men, but also in terms of the factory buildings, warehouse space, office equipment, etc., in which to carry out the complete program. In budgeting the capital outlay, it is important to observe four points:

1. Provision should be made for the added costs involved in using the present plant for extra shifts. The crowding of production often results in the intensification of "bottle neck" conditions at strategic points in a plant, that may be relieved only by enlarging the production equipment at these critical places.

2. Provision should be made for the renewal of parts of the present plant and fixtures. This problem is not unique to budgetary practice but is a part of all maintenance and replacement policies. However, the renewal costs must be included in the general budget plans in order to guarantee the perfect working of the manufacturing and finance programs.

3. Provision for repair and maintenance of all types of physical equipment, while not a part of the capital outlay must be provided for in the general planning and the costs. Main-

tenance expenses are often provided in the factory burden budget.

4. Provision should be made for the cost of improvements which are forced upon a concern from changes in the arts. New methods, new processes, and new equipment must be provided in order to keep up with the position of competitors.

Selling, Administrative, and Financial Expense Budgets

The departmental expense budgets include the items of cost not considered in the production, welfare, or purchase budgets. They are: (1) the selling expense budget, including advertising; (2) the office or general administrative budget; and (3) the financial expense budget.

Selling Expense Budget.—The consideration of the selling expense budget is often taken up directly in connection with the sales budget. The latter forms the basis for outlining the selling costs. Distribution expenses follow closely the types of goods handled, the territory in which marketing is done, the type and number of the sales force employed, and the type of advertising used.

Standard selling expense data are usually at hand in the form of previous selling costs. This information, together with the estimates of future changes in sales volume, general trade conditions, etc., supplied by the sales research department, form the basis for the formulation of the next period costs. Some institutions use a given per cent of sales as a measure of selling expense efficiency. All costs above this figure, say 6% of sales, are questioned, and explanations demanded as to why the variation exists.

Next to the outlay for welfare work, the productivity of marketing outlay is probably the most difficult of measurement. No criterion exists to show the efficacy of a given rate of salesmen's commission and traveling expenses, in terms of added sales or of sales maintained at or near the former level.

Such selling expenses, as trucking, warehouse, delivery, etc., can be measured and also forecast with a greater degree of certainty, through the use of physical standards that are available in the form of shop data. Rates of expenses secured from trade association data covering similar conditions often are valuable for comparative purposes. But here again, as in the case of plant operating conditions, exact similarity is infrequently encountered.

Scientific research covering all of the sales activities, looking toward the construction of standards for a given set of conditions, is the most satisfactory system of preplanning the usual selling expense items.

Administrative Expense Budget.—The plan employed in prefiguring standard expenses for the broad list of activities included in the group of departmental expenses, follows the program outlined for the forecasting of the factory expense budget. Being somewhat institutionalized because they do not vary with the volume of business conducted, the overhead cost items are relatively simple to forecast.

Administrative Budget for Department Store.—For a department store or large commercial concern, the expense budgets would cover the following costs and expenses: (1) merchandise costs, including purchases, freight-in, receiving expenses, warehousing and stock moving; (2) merchandise selling, including service, advertising, display and delivery expenses, exchanges, adjustments and alterations, mail order and shipping expenses; (3) central heat and light service expenses; and (4) office expenses such as credits, collections, accounting and auditing, statistics, research, comptrollership, office management, personnel management (see Figure 57).

In broad terms, the method of standardization consists of two parts. They are: (1) the determination of the standard service required of the individual worker and the working groups, for example, in the salesrooms, the work expected of

Period from..............to..............

	Budget Costs	Actual Costs	Increase	Decrease	Remarks
SALES EXPENSES:					
Salary—Sales Manager					
Expenses—Sales Manager					
Salaries—Salesmen					
Expenses—Salesmen					
Commissions					
Salaries—Sales Dept.					
Postage					
Stationery and Printing					
Advertising					
Telephone and Telegraph					
Sales Manuals					
Branch (Sales) Expenses					
Sundry Expenses					
ADMINISTRATIVE AND EXECUTIVE EXPENSES:					
Heat and Light					
Office Supplies					
Postage and Telephone					
Credits and Collections					
Personnel					
Auditing					
Statistical Service					
Sundry Expenses					
Executive Salaries					
PURCHASING EXPENSES:					
Freight					
Receiving					
Warehousing					
Stock Moving					
Total					

Figure 57. Expense Budget of a Commercial Concern

sales persons; in the office, the work expected of such persons as filing and billing clerks, typists, comptometer operators, etc.; (2) the determination of the quantity of work which can be reasonably expected of the equipment involved.

The performance should be based upon the volume of work expected during the budget period. The office planning, service planning, etc., should be based upon the sales program. There is always some variation in the quantity of work put through the administrative and executive offices that follows the amount of trade carried on. Standards are usually derived from (1) the past averages, (2) the best work done, (3) from "laboratory" experiments, or (4) from such outside data as may be used to apply to the given case.

A fair cost of securing such services is computed on the basis of the anticipated physical tasks and the standard expense rates set for the tasks. Variations from the standard are noted together with causes therefor.

The Financial Budget.—The financial budget is the central budget for which all planning is done. All budgets covering the control of physical quotas of goods and workers, contribute their information to the financial department in order that the demand for and supply of cash may be available for handling the various elements requiring financing. Without adequate finances, provided at the time they are needed, successful operations are impossible. Therefore, in order to secure the ready cash for meeting all obligations when they fall due, a separate budget is needed in most business concerns, for the purpose of correlating cash receipts and disbursements.

Cash may be considered in the same light as any other commodity or service requiring planning. Just as it is necessary to plan ahead for materials and labor quotas to meet a definite production program, so it is necessary to plan ahead for the dollar quotas, with which to meet a definite financial program. The financial budget is the vehicle for synchronizing income of funds with the outgo of funds.

Financial Budget Not an Accounting Standard.—Since the financial budget essentially is a device for correlating cash receipts and disbursements, it does not form an expense standard. The physical accompaniment of this budget is cash or credit, which stands in the place of the goods and manpower controlled in the operating and sales budgets. Since it reflects merely the planning for the handling of cash, it contains no element of cost. Standard cash receipts compared with the actual receipts, reveals no expense above or below standard. Shortage of cash realized from all sources is not an expense of that amount.

The financial budget, then, is largely a facilitating device and not an efficiency measuring device, in the sense that it does not measure the efficiency of the operation of physical or personnel factors as elements of business cost. It is included in the general discussion of control mechanics, not for its standard and record function over revenue and expense, but because of its immediate control over cash quotas required in a general budget plan, and its supervision over the important element of credits and financial operations. It does not come under the classification of accounting functions as such, but under the control functions of comptrollership. The financial budget has a standard function, however, in the fact that it checks the work of finance planning as such. Since it represents the summarization of all budgets from the cash aspect, it shows how successful has been the preplanning of money income and outgo.

The financial budget exercises an indirect control upon expenses through the previous setting of cost limits upon various activities. Where the cash planning goes along with the prefiguring of costs, there is a double inhibition placed upon the increasing of expenses. First, the standard, which was set in advance, is exceeded; and second, additional cash must be raised by the financial manager. Thus two control functions are encountered, costs and finance. This implies that standards may be wrong and may require revision, thus indicating that flexibility is one of the characteristics of standardization and budgetary work.

Some concerns place the actual cash at the disposal of active departmental heads, with the understanding that the funds thus provided shall be the outside figure available for securing the services, materials, supplies, etc., required to produce a certain agreed upon result.

Cash Budget Includes All Financial Operations.—The financial budget covers all of the responsibilities of the financial manager. It involves financial planning for the capital assets, the working assets, and all expense funds. It covers the planning for the redemption of all types of debts, the redemption of stock, the financing of repairs, replacements, and betterments.

In a former chapter[7] the financial laws formulated for the financing of fixed or frozen assets were outlined. It was noted that safety was found in carrying the "brick and mortar" assets and also the irreducible working capital fund only on liabilities having a remote maturity. These sources, it was noted, may include any or all of the following: stocks, bonds, mortgages, long-term notes, valuation reserves, surplus and surplus reserves.

It is imperative that the planning be done in such a way that the financial manager should have complete knowledge of the physical plant requirements, also the preplanned profits and reserves, upon which extensions may be financed. Also he should have in mind the expected dividend requirements, that must be financed as a cost of securing capital. Dividend payments normally come from working capital. If the operations of the business and the financing of new or replaced assets leave insufficient liquid assets with which to pay dividends, some additional financing must be planned, if the working capital is not to be depleted upon their payment. Profits and all types of reserves, except special "covered" reserves,[8] are not normally classified as sources of funds for providing new assets or for the reduction of debts. They are not usually taken into account in the budget; yet they form important elements to be considered over long periods of time as a part of the source of funds, along with the permanent investments.

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[7] See Chapter III.

Sources of Cash Income.—Since the major work in financial budgeting covers the planning for current operations, the greater emphasis is usually placed upon the analysis of the money receipts and payments involved in the purchasing, processing, and selling of goods.

What are the sources of cash in a going concern, and when are they available for use? That is the first question involved in the making of the cash receipts budget.

The primary sources of cash income are (see Figure 58): (1) collections from customers; (2) collections from customers' and other notes; (3) receipts from the discounting of customers' and other notes; (4) notes sold, through note brokers; (5) remittances from branches; and (6) receipts from the sale of securities held as secondary cash reserves.

The secondary sources are: (1) collections from customers whose accounts have been charged to profit and loss; (2) cash from overpayments made to creditors; (3) interest on bonds, notes, dividends on stock held for investment purposes; (4) extraneous activities such as rent on workmen's houses, sales of food in restaurants, sub-leases, insurance rebates, etc.; and (5) sale of assets.

The amount of monthly receipts can be ascertained from the sales program which forecasts the cash and account sales

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[8] See Chapter IV.

for each month of the year. Sales and credit terms data can be secured from past records. The data on the collections from the account sales can be computed from the lag in collections from past sales.[9] The rate of payment on the accounts depends upon whether or not there are pronounced seasonal or cyclical sales, and the general conditions of credit and business in the various territories served, for the period covered by the budget forecast. Note should be made of the customers taking cash discounts; also the factors of bad debts, rebates, allowances, returns, freight charges to customers upon which deductions are made.

Special receipts from extraneous sources can be forecast with a limited degree of certainty. Those from regular company activities, such as rentals from workers, sales of minor service, fees, etc., can be based upon records of the past, modified by conditions affecting these activities in the future. Receipts from investments can be calculated with greater certainty. Coupons and interest income are based upon the amount of securities owned, with deductions for sales, and additions for new investments bought. No accruals are included in this income, as only the cash secured from matured coupons is available. The usual form for showing the cash receipts budget is shown in Figure 58.

Cash Disbursements Budget.—The cash disbursements budget contains a listing of all major activities in which the business is engaged. A list of these by functions will show the following classification: (1) commitments and current outlay involving the purchases of goods bought for resale; (2) commitments and current outlay involving the production budget; (3) commitments and current outlay for buildings, furniture, fixtures, machinery, etc.; (4) commitments and current outlay for all expenses such as selling, advertising, man-

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[9] For the method of computing the legitimate lag, the normal delinquencies, and the average age of accounts receivable, see Chapters XII, XIII, and XIV.

ITEM	JANUARY			FEBRUARY			MARCH		
	Expected	Actual	Difference	Expected	Actual	Difference	Expected	Actual	Difference
Collections: Customers									
Collections: Notes									
Cash Sales:									
Dept. 1									
Dept. 2									
Notes Discounted									
Notes Sold to Brokers									
Sale of Securities									
Remittances from Branches									
Miscellaneous									
Bad Debts Collected									
Refunds									
Interest and Dividends									
Company Activities									
Rent Workmen's Houses									
Sale of Food									
Entertainment									
Other Sources Est.									
TOTALS									

Figure 58. Cash Receipts Budget

agement and administration, general overhead and finance; and (5) commitments and current outlay for company activities such as welfare work, expenses involved in the sale of outside service, restaurants, gymnasium, etc.

	January	February	March
Cash at Beginning of Period			
Total Receipts by Departments			
Total Disbursements by Departments			
Cash Shortage			
Bank Loans			
Discount Customers' Notes			
Sale of Securities			
Renewals Bank Loans			

Figure 59. Summary of Cash Receipts and Disbursements

The making of bank loans, the selling of securities to replenish the cash reserves, the rediscounting of customers' notes, are all timed in such a way as to fill in the cash income not supplied by the normal receipts in their season.[10] The super-cash budget is shown in Figure 59.

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[10] The reader should review the discussions on the function of bank loans in the financing of current assets, Chapter XIV. Also see McKinsey, Budgetary Control, Chapters XIX and XX.

APPENDIX

PROBLEMS

PROBLEM 1

Rex Baking Company

Please read the complete instructions before beginning work.

I. Objects

The primary purpose of the laboratory exercises is the development of an understanding of the principles and technique involved in the construction of financial and operating standards that may be used by management in locating the ultimate causes of internal business problems. The viewpoint in approaching the problem of business control is that of the comptroller, who, as a staff member, is charged with the duty of securing all of the critical statistical information relative to the trends in internal financial and operating conditions. The approach to an analysis of these problems is made from a study of the accounting statements. It is assumed that no accounting standards exist in the plant, the office, the selling, or the finance departments. The "fiscal" and comparative statements should be critically examined in order to ascertain from them where troubles are originating.

These financial statements should be viewed as statistical indices that give a "research orientation" into the various fields that supply the dynamics of income and cost variations. This important function of statement analysis should not be overlooked; likewise the limitations inherent in the process. Orientation is essential; however, the process of sustained research effort to the point of locating the ultimite source of business ailments is the real responsibility of the financial statistician.

The comptroller, whose position the student is asked to take, should use his analyzed statements as starting points in the search for the effective causes of net income variation and financial structural alterations.

II. Procedure

(A) Make out a complete set of accounting reports for the years 1927 and 1928. Such reports as you think necessary for full presentation of data should be prepared. Suggested statements may be found in the text.

(B) Make a written report to the general manager, or board of directors, covering the trends of financial and operating factors, from 1927 to 1928. This report should be brief, to the point, and cover only those factors that should receive the attention of management. The favorable as well as the unfavorable condition should be featured.

(C) In order to properly functionalize the reports and to show individual responsibilities, it is further suggested that separate schedules be prepared covering the activities of the functional officers.

1. The production superintendent has full control over production, which include (a) the buying of raw materials, supplies, etc.; (b) charge over the factory personnel; and (c) authority over production procedures. In order to secure a more thorough check on the causes for changes in the manufacturing costs, make out a unit report for the years 1927 and 1928. The works manager informs you that "the number of finished units manufactured and delivered to the finished goods warehouse" for the two years were as follows: 1927, 410,436; 1928, 451,200.

Lacking other standards from which to measure the efficiency of current operations, 1927 reports may be taken as standard for comparison.

A part of the general report covering the production superintendent's work should be devoted to a brief statement of the ultimate factors of cost variations that lie beyond the scope of the comparative statements. Include such factors as are reducible to statistical terms, but upon which you are unable to report because of the insufficiency of the machinery of accounting measurements at hand. Suggest such changes in the measuring plan in your report as you deem necessary to more fully analyze and control these factors.

2. The sales manager has charge of the sales procedures, which include (a) the acquiring of sales volume; (b) the pricing of goods; and (c) the selling expense budget. The same general reporting procedure should be used as was followed in the case of the production superintendent report. The same type of supplementary report should be made covering the ultimate factors that furnish the dynamics of income and expense variation in the selling field.

3. The office manager has charge of all administrative budget costs. Use the classification of accounts suggested in the problem for this

group of expenses, and make the same type of report as outlined above.

4. The credit manager has charge of credit extensions. Determine as far as possible from the statements the condition of the trade accounts, as to—(a) their relative age; (b) the tendency to over-accumulation; (c) the approximate amount of delinquent accounts; and (d) the ratio of bad debts (amount charged to profit and loss for reserve purposes) compared to net sales. (The credit terms for the two years were 1%/10, n/30.)

Make such suggestions as you think appropriate for deriving internal standards for—(a) measuring the efficiency of the operations of the credit department as a whole; (b) measuring credit risks to customers.

5. The finance manager[1] has charge of all financial operations. His chief stewardship is the safety of the investment, that is, the protection of the corporate estate for all equity holders. The ordering of financial matters that make for the solvency of the firm is his responsibility. His activities are shown partly in the balance sheet and partly in the operating statements. In moderate-sized concerns such as this, he virtually acts as comptroller. On the operating side he is directly responsible for the costs of borrowed capital; in some cases, collection costs and discounts. He is credited with financial income. He occupies joint territory with the production superintendent in financing all inventories; and with the credit manager in financing credit extensions. The finance department has charge of the initial and subsequent financing of the physical properties and the "funded working capital," through long-term financing. Report on the adequacy of the firm's working capital in 1928. (See Chapters XIII and XIV.) Wholesale credit is 3%/15, n/45. Note the sales discounts and the purchase discounts taken.

6. The chief accountant has charge of all accounting procedure. Comment on any accounting practice that would be benefited by change.

(D) In approaching an analysis of the operating problems of the Rex Baking Company, it is suggested that:

1. The first year be used as standard, as suggested previously.

2. The causes for variation in net profits should be used as a starting point in isolating the elements that have changed. This report will

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[1] A separate report may be made on the general financial policies and financial trends, independently of the report of the finance manager. Under this plan the financial manager would be charged with interest and discounts, bad debts, collection costs, and those items that are primarily financial in nature.

give orientation to the field of sales, (price and volume) costs, selling, administrative, and financial expenses, where study should then be made of the factors, revealed in the statements, that have resulted in the changes in costs and expenses. Observe carefully the change in unit production costs for 1928, and the effect upon profits.

3. The third step consists in outlining the secondary statistical sources of sales and cost variations, previously outlined, that lie beyond the accounting ledgers, but which should be isolated and measured if complete control, from a statistical accounting standpoint, is desired.[2]

REX BAKING COMPANY

TRIAL BALANCE—DECEMBER 31, 1927

1. Capital Stock—Common		$100,000.00
2. Treasury Stock—Common	$ 5,000.00	
3. Capital Stock—Preferred 6%		50,000.00
4. Unsubscribed Stock—Preferred	1,000.00	
5. Surplus		22,629.40
6. Land	27,000.00	
7. Factory Buildings	78,000.00	
8. Res. for Depreciation of Factory Building		19,900.00
9. Machinery	55,080.00	
10. Res. for Depreciation of Machinery		21,168.00
11. Tools	5,800.00	
12. Office Equipment	3,749.00	
13. Res. for Depreciation of Office Equip.		1,094.00
14. Goodwill	7,500.00	
15. Bonds (Investments) 7%	13,000.00	
16. Bonds Payable 6½%		70,000.00
17. Raw Materials Inventory, Jan. 1, 1927	12,655.00	
18. Goods in Process, Jan. 1, 1927	8,324.00	
19. Finished Goods, Jan. 1, 1927	16,000.00	
20. Notes Receivable	12,450.00	
21. Notes Receivable Discounted		3,780.00
22. Accounts Receivable	54,729.80	
23. Reserve for Bad Debts		378.00
24. Cash in Bank	36,429.00	
25. Petty Cash	200.00	
26. Accounts Payable		8,429.25
27. Notes Payable		7,836.00
28. Bank Loans		8,740.00
29. Sales		260,817.00
30. Sales Returns and Allowances	1,178.00	
31. Purchases—Raw Materials	79,325.00	
32. Purchase Returns		2,749.00
33. Freight-In—Raw Materials	2,348.00	
34. Direct Labor	81,329.00	
35. Indirect Labor	15,117.00	

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[2] See Chapters XV to XX, inclusive.

36. Heat, Light, and Power	$ 9,381.00	
37. Repairs to Factory Buildings	345.00	
38. Waste Materials—Breakage	734.00	
39. Taxes	1,046.00	
40. Insurance	1,850.00	
41. Factory Supplies Purchased	2,431.85	
42. Miscellaneous Factory Expenses	3,876.00	
43. Advertising	6,284.00	
44. Salesmen's Salaries	11,140.00	
45. Salesmen's Traveling Expenses	6,843.00	
46. Miscellaneous Selling Expenses	1,259.00	
47. Office Salaries	4,756.00	
48. Officers' Salaries	6,500.00	
49. Stationery and Printing	902.00	
50. Office Supplies	370.00	
51. Telephone and Telegraph	218.00	
52. Miscellaneous General Expenses	397.00	
53. Interest on Bonds Payable	2,275.00	
54. Interest on Notes Payable	953.00	
55. Interest on Notes Receivable		$ 398.00
56. Discount on Purchases		1,277.00
57. Interest on Bonds		455.00
58. Sales Discounts	1,876.00	
59. Bad Debts		
60. Depreciation		
	$579,650.65	$579,650.65

REX BAKING COMPANY

ADJUSTMENTS—DECEMBER 31, 1927

Insurance Deferred	(40)	$ 675.00
Office Supplies Unused	(50)	78.00
Accrued Taxes	(39)	540.00
Accrued Direct Labor	(34)	1,953.00
Accrued Indirect Labor	(35)	1,375.00
Accrued Interest Notes Payable	(54)	198.00
Accrued Interest Bonds Payable	(53)	2,275.00
Accrued Power Costs	(36)	843.00
Accrued Interest Bonds	(57)	455.00
Accrued Interest Receivable	(55)	175.00
Reserve for Bad Debts (add)	(23)	1,122.00

Depreciation:

Factory Buildings	4%
Machinery	8%
Tools	$1,350 to be written off
Office Equipment	10%

Inventories:

Raw Materials	(17)	$14,743.00
Goods in Process *	(18)	8,572.00
Finished Goods	(19)	18,275.00
Factory Supplies	(41)	1,296.00

Divide Insurance and Taxes 90% to Manufacturing and 10% to Selling Expenses.

No dividends were paid on Common Stock. The regular 6% was paid on Preferred Stock, Dec. 15, 1927.

Land was written up $9,427.40.

* Goods in Process Inventory, Dec. 31, 1927, consisted of:

(a) Raw Materials	$3,247
(b) Labor	2,745
(c) Burden	2,580
	$8,572

The Goods in Process Inventory, Jan. 1, 1927, consisted of:

(a) Raw Materials	$3,143
(b) Labor	2,896
(c) Burden	2,285
	$8,324

Required:

WORKING SHEET

EXHIBIT A. The Balance Sheet for 1927, with analysis showing:
1. Per cent of each reserve to its related asset account.
2. Per cent of each fixed asset to total fixed assets.
3. Per cent of each current asset to total current assets, and similarly with all groups.
4. Per cent of each group of assets to total assets, and similarly with liabilities.
5. Supporting schedules and per cent of each item to respective totals.
6. Analysis of surplus.

EXHIBIT B. The Profit and Loss Statement, and supporting schedules:
1. Profit and Loss Statement, with analysis showing: per cent of group expenses to net sales.
2. Schedule of Selling Expenses, with analysis showing: (a) per cent of each item to total selling expense; (b) per cent of each item to net sales.
3. Schedule of General Expenses, with analysis showing: (a) per cent of each item to total general expense; (b) per cent of each item to net sales.
4. Schedule of financial management expenses and income with analysis showing: (a) per cent of each item to financial expense or income; (b) per cent of each item to net sales.

EXHIBIT C. The Statement of Cost of Goods Manufactured, and supporting schedules:
1. Statement of Cost of Goods Manufactured (with goods in process distributed), with analysis showing: per cent of each item to total manufacturing costs.
2. Schedule of Overhead Expenses with analysis showing: (a) per cent of each item to total overhead expenses; (b) per cent of each item to total manufacturing costs.
3. Unit cost and cost of sales report, showing materials, labor, and burden costs per unit of output manufactured. Also shows the unit cost of selling, administration and finance. (The cost of the initial inventory of 1927 was the same as the current cost.)

MISCELLANEOUS RATIOS AND PER CENTS

(A) Profit Ratios:
1. Ratio of profits to total capital employed.
2. Rate of earnings on common stock.

(B) Working Capital:
1. Statement of working capital, and ratio of current assets to current liabilities.

(C) Turnovers:
1. Turnover of finished goods.
2. Turnover of total inventories.
3. Turnover of current assets.

(D) Analysis of Accounts Receivable:
1. Credit terms 1%/10, n/30. What per cent of sales remain uncollected?
2. On the basis of the average monthly sales, assuming them to be uniform throughout the year, what is the amount of delinquent collections, and the average age of the undiscounted accounts? (See note below.)
3. Ratio of bad debts to sales.

(E) Analysis of Accounts Payable:
1. Per cent of purchases unpaid. Terms 3/15, n/45.
2. Per cent of accounts paid within the discount period.

(F) Analysis of Raw Material Purchases and Inventories:
1. Per cent of purchases remaining in raw material inventory.
2. Per cent of month's raw material requirements provided by opening inventory.

(G) Analysis of Cost to Manufacture:
1. Ratio of cost of goods manufactured to closing inventory of finished goods.
2. Per cent of month's sales requirements provided by opening inventory of finished goods.
3. Distribution of manufacturing cost among: goods in process at end of period; finished goods at end of period; goods sold during the period.

(H) The ratio of the inside or owner's equity to total liabilities.

(I) The ratio of sales to fixed assets, i.e., plant, and to the total capital employed.

(NOTE the sales discount taken compared with the possible discounts, also the fact that the discount has not expired on sales from December 22 to December 31, inclusive.)

PROBLEM 2

Rex Baking Company

TRIAL BALANCE—DECEMBER 31, 1928

1. Capital Stock—Common		$100,000.00
2. Treasury Stock—Common	$5,000.00	
3. Capital Stock—Preferred 6%		50,000.00
4. Surplus		34,724.25
5. Land	37,000.00	
6. Factory Buildings	90,000.00	
7. Res. for Depreciation of Factory Building		23,020.00
8. Machinery	56,080.00	
9. Res. for Depreciation of Machinery		25,574.40
10. Tools	6,450.00	
11. Office Equipment	3,749.00	
12. Res. for Depreciation of Office Equipment		1,468.90
13. Goodwill	6,500.00	
14. Bonds (Investments) 7%	13,000.00	
15. Bonds Payable 6½%		70,000.00
16. Raw Materials Inventory, Jan. 1	14,743.00	
17. Goods in Process Inventory, Jan. 1	8,572.00	
18. Finished Goods Inventory, Jan. 1	18,275.00	
19. Notes Receivable	10,540.00	
20. Notes Receivable Discounted		4,500.00
21. Accounts Receivable	53,504.00	
22. Reserve for Bad Debts		500.00
23. Cash in Bank	31,779.55	
24. Petty Cash	200.00	
25. Accounts Payable		8,673.00
26. Notes Payable		8,500.00
27. Bank Loans		9,550.00
28. Sales		307,204.00
29. Sales Returns and Allowances	3,253.00	
30. Purchases—Raw Materials	89,750.00	
31. Purchases—Returns		1,950.00
32. Freight-In—Raw Materials	2,678.00	
33. Direct Labor	99,593.00	
34. Indirect Labor	17,628.00	
35. Heat, Light, and Power	10,543.00	
36. Repairs to Factory Building	$ 521.00	
37. Waste Materials—Breakage	2,468.00	
38. Taxes	1,304.00	
39. Insurance	1,750.00	
40. Factory Supplies Purchased	2,787.00	
41. Miscellaneous Factory Expenses	5,103.00	
42. Advertising	12,168.00	
43. Salesmen's Salaries	12,450.00	
44. Salesmen's Traveling Expenses	10,940.00	
45. Miscellaneous Selling Expenses	1,133.00	
46. Office Salaries	4,850.00	
47. Officers' Salaries	6,500.00	
48. Stationery and Printing	850.00	
49. Office Supplies	412.00	
50. Telephone and Telegraph	225.00	
51. Miscellaneous General Expenses	375.00	
52. Interest on Bonds	2,275.00	
53. Interest on Notes Payable	1,231.50	
54. Interest on Notes Receivable		$ 643.00
55. Discount on Purchases		1,157.00
56. Interest on Bonds (Investment)		682.50
57. Sales Discount	1,967.00	
	$648,147.05	$648,147.05

REX BAKING COMPANY

ADJUSTMENTS—DECEMBER 31, 1928

Accrued Taxes			(38)	$ 612.00
Accrued Interest on Bonds			(52)	2,275.00
Accrued Labor—Direct			(33)	2,140.00
Accrued Labor—Indirect			(34)	1,250.00
Accrued Interest Notes Payable			(53)	173.00
Accrued Heat, Light, and Power			(35)	752.00
Accrued Interest Receivable Bonds	(56)	$ 227.50		
Accrued Interest Receivables	(54)	210.00		
Reserve for Bad Debts (add)	(22)	1,070.00		
Depreciation:				
Factory Buildings 4%	(7)	3,600.00		
Machinery 8%	(9)	4,486.40		
Tools written off	(10)	1,275.00		
Office Equipment 10%	(12)	374.90		
Inventories:				
Raw Materials	(16)	13,347.00		
Goods in Process*	(17)	13,264.00		

* Goods in Process Inventory, December 31, 1928, consisted of:

(a) Raw Materials	$4,369
(b) Labor	4,986
(c) Burden	3,909
	$13,264

Finished Goods	(18)	$14,212.00
Factory Supplies	(40)	1,305.00
Deferred Insurance		550.00
Deferred Office Supplies		94.00

Divide Insurance and Taxes 90% to Manufacturing and 10% to Selling Expense.

On December 15, 1928, Dividends 8% Common Stock $7,600 and Dividends 6% Preferred Stock $3,000 were paid in cash.

Factory Building was written up $12,000.

Goodwill was written down $1,000.

Required:

Exhibit A. Balance Sheet, with supporting schedules together with analysis showing:

1. Per cent of each reserve to its related asset account.
2. Per cent of each current asset to total current assets and to total assets.
3. Per cent of each fixed asset to total fixed assets and to total assets.
4. Per cent of each group of assets to total assets.
5. Per cent of each liability to its related group and to total liabilities.

Exhibit B. Profit and Loss Statement, with supporting schedules together with analysis showing:

1. Per cent of total group (Selling, General, and Finance) to net sales.
2. Schedule of Selling Expenses, showing per cent of each item to total selling expenses and also per cent of each item to net sales.
3. Schedule of General Expenses, showing per cent of each item to total general expenses and also per cent of each item to net sales.
4. Schedule of Financial Expenses, showing per cent of each item to total financial expenses and also per cent of each item to net sales.

Exhibit C. Statement of Cost of Manufactured Goods and Cost of Sales, with supporting schedules, together with analysis showing:

1. Per cent of each item to total manufacturing costs.
2. Per cent of each manufacturing expense to total factory overhead.

Exhibit D. Comparative Balance Sheet, showing source and utilization of funds, in structural form:

1. Fixed asset financing.
2. Working capital financing.
3. General trend of funds.

Exhibit E. Comparative Profit and Loss Statement, showing increase or decrease of items in per cents:

1. Per cent of each item to net sales of the year.
2. Causes for variation in net profits, due to (a) change in prices, (b) change in cost of sales, and (c) changes in expenses.

Exhibit F. Comparative Profit and Loss Statements, showing absolute changes in dollars and also per cent of increase or decrease:

1. Profit and Loss Statements, with analysis showing: (a) increase or decrease of each item in dollars; (b) per cent of increase or decrease, based on first year.
2. Statement of Cost of Goods Manufactured, with analysis showing: (a) increase or decrease of each item in dollars; (b) per cent of increase or decrease, based on first year.
3. Schedules of Manufacturing Expense, with analysis showing: (a) increase or decrease of each item in dollars; (b) per cent of increase or decrease, based on first year.
4. Schedules of Selling Expense, with analysis showing: (a) increase or decrease in each item in dollars; (b) per cent of increase or decrease.
5. Schedules of General Expense, with analysis showing: (a) increase or decrease in each item in dollars; (b) per cent of increase or decrease.
6. Schedules of Financial Expense and Income, with analysis showing: (a) increase or decrease in each item in dollars; (b) per cet of increase or decrease.
7. Statement of manufacturing costs with analysis showing (a) increase or decrease in the per cent of each cost item to total costs, and each burden item to total burden, and (b) increase or decrease in unit production costs and unit cost of selling, administration and finance, the second year compared with the first.

Comparison of Miscellaneous Ratios and Per Cents—

(A) Profit Ratios:
  1. Ratio of profits to capital, second year compared with first year.
  2. Rate of earnings on common stock (preferred bears 6%), second year compared with last year.

(B) Turnovers:

1. Turnover of finished goods, compared with first year.
2. Turnover of total inventories, compared with the first year.
3. Turnover of current assets, compared with last year.

(C) Analysis of Accounts Receivable:
1. Credit terms 1%/10, n/30. What per cent of sales remains uncollected, compared with last year?
2. On the basis of the average monthly sales, assuming them to be uniform throughout the year, what is the amount of delinquent collections compared with first year, and their average age?
3. Ratio of bad debts to sales compared with last year?

(D) Analysis of Accounts Payable:
1. Per cent of purchases unpaid. Terms 3/15, n/45.
2. Per cent of accounts paid within the discount period, both compared with last year.

(E) Analysis of Raw Material Purchases and Inventories:
1. Per cent of purchases remaining in raw material inventory, compared with last year.
2. Per cent of month's raw material requirements provided by opening inventory, compared with last year.

(F) Analysis of Cost to Manufacture:
1. Ratio of cost of goods manufactured to closing inventory of finished goods.
2. Per cent of month's sales requirements provided by opening inventory of finished goods compared with last year.
3. Distribution of manufacturing costs among goods in process at end of period; finished goods at end of period; goods sold during the period, compared with last year.

(G) Working Capital:
1. Statement of working capital, and ratio of current assets to current liabilities, compared with last year.
2. Has the firm a sufficient amount of working capital? Report under finance manager.

(NOTE: Exhibits A, B, and C may be omitted.)

PROBLEM 3

Northwest Lime and Cement Company

The two series of problems, Nos. 3 and 4, of the Northwest Lime and Cement Company, should be worked together.

Make complete statements for both years. The 1927 year is taken as standard, for comparing the 1928 performance.

The objects of the problems are the same as those of the Rex Baking Company. The procedures in making the "fiscal" and comparative statements are identical. Read over the instructions for the Rex Baking Company problem before proceeding with the Northwest Lime and Cement Company.

Detailed instructions for the accounting adjustments, etc., of the Northwest Lime and Cement Company, follow the trial balances for 1927 and 1928.

You are called in to make a study of this firm in order to ascertain the causes for the decline in the profits during the fiscal period ending December 31, 1928, and to appraise the status of the financial condition of the firm as revealed in the balance sheet at closing date.

A separate report should be made covering the operations of the production superintendent who is charged with all manufacturing operations connected with the production of lime. His supervision covers: (1) quarrying of the lime rock and its transportation to the kilns; (2) the cooperage of the barrels; (3) burning of the rock; and (4) drawing of the lime and filling of the barrels.

The works manager states that there was produced at the plant the following barrels: 1927, 232,558; 1928, 236,307.

The sales price of lime during these years remained at the same figure of $2 per barrel (f.a.s.). Cement remained the same figure of $4 per barrel.

The sales manager has charge of the usual sales operations; the general administrative or office manager, the office and general expenses; the finance manager, the general finances of the firm (see instructions in the Rex Baking Company for an alternative report on the finance manager).

The lime is sold f.a.s. plant dock. It imports and sells a side line of cement which is jobbed on a very attractive basis. In addition it handles a miscellaneous line of building materials on a commission basis.

The company owns its (1) workmen's houses, (2) a hotel, (3) a commissary for supplying the company's needs as well as the workers' families, (4) a farm which is operated to supply produce for the commissary and the community. The costs and income from the above activities, including the commissions on building materials, should be reported as Extraneous Expense and Income in the profit and loss statement.

All lines sold—the lime, the cement and the building materials—are carried by the same salesmen. Selling expenses are not departmentalized in the reports.

Northwest Lime and Cement Company

Trial Balance—December 31, 1927

1. Buildings	$ 180,000.00	
2. Land	50,000.00	
3. Delivery Equipment	4,500.00	
4. Tools	3,750.00	
5. Machinery	142,050.00	
6. Furniture and Fixtures	12,645.00	
7. Patents	3,000.00	
8. Goodwill	15,000.00	
9. Dividends (Preferred Stock), Dec. 1, 1927		$ 7,200.00
10. Bond Interest	3,500.00	
11. Freight-In	6,520.50	
12. Freight-Out		1,854.00
13. Securities (Temporary)	10,400.00	
14. Catalogues, Pamphlets	2,000.00	
15. Collection Expense	3,100.00	
16. Extraneous Loss (Suspense)	10,875.00	
17. Outdoor Advertising	1,500.00	
18. General Advertising	5,500.00	
19. Donations	100.00	
20. Entertainment of Customers	250.00	
21. Industrial Insurance	1,365.00	
22. Rent Workmen's Houses		4,375.00
23. Maintenance Workmen's Houses	3,164.00	
24. Bonus Direct Labor	2,350.00	
25. Watchman's Wages	844.00	
26. Credit Report Expenses	120.00	
27. Transportation Claims	4,328.75	
28. Laboratory Expenses	2,500.00	
29. Accounting Department	2,000.00	
30. Legal Expenses	487.30	
31. Bad Debts Collected		476.34
32. Delivery Expenses	1,247.35	
33. Insurance	2,890.67	
34. Petty Cash	250.00	
35. Due Consignors		4,174.60
36. Materials Lime Inventory, Jan. 1, 1927	25,723.46	
37. Finished Goods, Lime Inventory, Jan. 1, 1927	18,162.14	
38. Trade Debtors	128,223.28	
39. Notes Receivable	16,520.00	
40. Notes Receivable Discounted		5,439.82

41. Raw Materials Quarried and Purchases	$ 231,742.78	
42. Sales—Lime Products		$ 474,125.79
43. Sales—Cement		180,741.65
44. Returned Sales—Lime	2,125.83	
45. Returned Sales—Cement	1,749.81	
46. Raw Materials Returned		3,269.21
47. Cement Bags Returned		749.60
48. Cooperage Supplies	8,876.41	
49. Direct Labor	74,329.88	
50. Indirect Labor	15,876.40	
51. Foremen's Wages	4,100.00	
52. Light and Power Department	8,376.40	
53. Miscellaneous Factory Expenses	181.17	
54. Accounts Payable		45,722.73
55. Office Expenses	1,623.44	
56. Warehouse Labor (Finished Goods)	329.74	
57. Repairs to Machinery	1,922.45	
58. Repairs to Buildings	2,271.64	
59. Drawings and Patterns	8,374.25	
60. Res. for Depreciation of Buildings		12,875.22
61. Res. for Depreciation of Machinery		17,862.14
62. Res. for Depreciation of Delivery Equipment		875.29
63. Res. for Depreciation of Furniture and Fixtures		671.82
64. Res. for Depreciation of Patents		500.00
65. Res. for Bond Sinking Fund		30,000.00
66. Res. for Contingencies		25,400.00
67. Interest Income		9,387.55
68. Interest Cost	8,372.89	
69. Salesmen's Salaries	9,832.17	
70. Salesmen's Commissions	10,743.92	
71. Reserve Bad Debts		2,973.86
72. Discount on Sales	7,431.86	
73. Discount on Purchases		3,781.62
74. Office Salaries	6,439.80	
75. Capital Stock—Preferred 6%		150,000.00
76. Capital Stock—Common		200,000.00
77. Unissued Preferred Stock	40,000.00	
78. Treasury Stock Common	40,000.00	
79. Surplus		44,866.39
80. Employees' Benefit Fund	25,605.70	
81. Bonds Payable, 1915—1935		100,000.00
82. Reserve for Employees' Benefit Fund		25,605.70
83. Discount on Bonds	6,390.00	
84. City National Bank	22,175.87	
85. Bond Sinking Fund	30,000.00	
86. Reserve for Redemption of Preferred Stock		28,000.00

87. Taxes (Local)	$ 3,186.24	
88. Purchases—Cement	101,876.41	
89. Lime in Process Inventory, Jan. 1, 1927	5,481.19	
90. Notes Payable		$ 14,200.00
91. Commissions Earned (Consignments)		2,822.89
92. Reserve for Depreciation of Workmen's Houses		4,792.86
93. Wrapping and Shipping Supplies	1,129.10	
94. Floating Equipment (Tugs—Scows)	10,982.73	
95. Workmen's Houses	18,392.17	
96. Roads and Tramways	5,198.76	
97. Commissary Department Income		832.67
98. Hotel Revenue Account	991.80	
99. Farm Revenue Account	2,867.40	
100. Inventory Cement, Jan. 1, 1927, Finished Goods	10,375.42	
101. Reserve for Depreciation of Floating Equipment		3,896.82
102. Inventory Commissary Dept., Dec. 31.	7,561.32	
Totals	$1,407,473.57	$1,407,473.57

NORTHWEST LIME AND CEMENT COMPANY, 1927

INVENTORIES AND ADJUSTMENTS

(A) INVENTORIES, DEC. 31, 1927:

1. Cooperage Supplies	$ 471.36
2. Wrapping and Shipping Supplies	291.28
3. Catalogues and Pamphlets	485.00
4. Outdoor Advertising	1,500.00
5. Lime on Hand	18,369.74
6. Cement on Hand	12,318.64
7. Raw Materials Lime	22,176.42
8. Light and Power Supplies	784.63
9. Lime in Process: Materials	1,874.56
10. Labor	2,218.65
11. Manufacturing Burden	2,889.52
12. Laboratory Supplies	250.00
13. Industrial Insurance Prepaid	475.00
14. Insurance Prepaid	1,137.50
15. Interest Prepaid	360.70

(B) ACCRUALS:

16. Direct Labor	2,823.60
17. Indirect Labor	1,262.31
18. Maintenance Workmen's Houses	562.80
19. Delivery Expenses	371.29
20. Foremen's Wages	187.50

21. Interest (Cost)	$ 362.76
22. Salesmen's Commissions	974.19
23. Taxes Local	2,782.50
23 a. Bond Interest	3,500.00

(C) FIRE LOSS ADJUSTMENT:

24. Of the total Repairs to Machinery $922.45 is a replacement of new machinery.

25. Of the total Repairs to Buildings $1,271.64 is a replacement of the building, which was rebuilt. The items were incorrectly classified by the bookkeeper.

26. Of the total amount of the Extraneous Loss $10,875
($5,000 being a building loss and $5,875 a machine
27. loss), write off this year $1,114.50. The bookkeeper
has adjusted the proper reserves and capital ac-
28. counts. The insurance has been collected.

(D) DEPRECIATION AT THE FOLLOWING RATES AND AMOUNTS:

29. (a) Workmen's Houses (Extraneous Expense)	1,103.53
30. (b) Floating Equipment (Charge Factory Overhead)	549.14
31. (c) Buildings (Allotted)	5,561.90
32. (d) Machinery (Factory Overhead)	13,972.48
33. (e) Delivery Equipment (Selling)	689.01
34. (f) Furniture and Fixtures (Allotted)	361.05
35. (g) Patents (Factory Overhead)	400.00
36. (h) Loss on Tools (Factory Overhead)	600.00

(E) MISCELLANEOUS ADJUSTMENTS:

37. Write off Bond Discount	639.00
38. Add to the Reserve (Bond) Sinking Fund and to Sinking Fund	3,000.00
39. Add to Res. for Contingencies	7,450.75
40. Add to Res. for Redemption of Preferred Stock	4,800.00
40a. Add to Bad Debts Reserve	1,790.65

The Lime in Process, Jan. 1, 1927, consisted:

41. Materials	1,710.05
42. Direct Labor	1,822.70
43. Factory Expenses	1,948.44

44. Transportation claims are considered 80% good. Set up a reserve. 75% of the loss was on cement purchases, the balance lime production.

(F) DISTRIBUTE THE FOLLOWING COSTS AS DIRECTED BY THE COST CLERK:

45. (a) Building Expenses:

Include Watchman's Wages	$ 844.00	
Depreciation on Buildings	5,561.90	
Repairs to Buildings	1,000.00	
Insurance (net)	1,753.17	$ 9,159.07

To Manufacturing	45%
To Selling	35%
To Office	20%

46. (b) Light, Heat, and Power on same basis as Building Expenses (52).

47. (c) Furniture and Fixture Depreciation on same basis as Building Expense.

48. (d) Allot Freight-in to Raw Materials:

Lime	60%
Cement Purchases	40%

49. (e) Local Taxes: Of the total charge—

Manufacturing	50%
Workmen's Houses Extraneous	5%
Floating Equipment to Mfg.	6%
Selling	30%
Office	9%
	100%

50 Freight-Out is a liability.

51. Income Tax 13½% Net Profits after the usual corporate exemption. Set up a reserve.

COMMENTS:

1. Account 36 is Raw Materials Lime (lime rock unburned).
2. Account 41, Raw Materials Quarried and Purchased, represents cost of quarrying lime rock and delivering it to the kilns. It is a control account.
3. Account 46, Raw Materials Returned, is supplies, powder, steel, etc., used in the quarry and returned during the year.
4. Account 47, Cement Bags Returned, ties with Account 88 as a credit.
5. Accounts 80 and 82 represent an accumulated benefit fund belonging to the employees, which is held in trust. The Reserve for Employees Bonus Fund is the trustee obligation to the employees.
6. Account 100, Inventory–Cement, is the finished goods sold as a side line in Department 2. Department 1 is the production department.
7. Inventory 5, Lime on Hand, is finished goods.
8. Inventory 7, Raw Materials, is lime rock in the quarry, on the tram cars, and in the bunkers.
9. Inventory 13, Industrial Insurance Prepaid, is an overpayment of insurance.
10. Place the following departments under the heading of "Extraneous Income and Expense": (a) the commissary department; (b) the hotel; (c) the farm; (d) commissions; (e) workmen's houses (income and expense).

11. Inventory Commissary Dept., Dec. 31, is the final inventory which has been credited to the Commissary Dept. Income account. The initial inventory in both years was debited to this account prior to closing. (See page 423.)

Required:

WORKING SHEET.

EXHIBIT A. The Balance Sheet for 1927, with analysis showing:

1. Per cent of each reserve to its related asset account.
2. Per cent of each fixed asset to total fixed assets.
3. Per cent of each current asset to total current assets, and similarly with all groups.
4. Per cent of each group of assets to total assets, and similarly with liabilities.
5. Schedules of deferred charges, accrued liabilities, inventories, showing per cent of each item to respective totals.

EXHIBIT B. The Profit and Loss Statement, and supporting schedules:

1. Profit and Loss Statement, with analysis showing: per cent of group expenses to net sales.
2. Schedule of Selling Expenses, with analysis showing: (a) per cent of each item to total selling expense; (b) per cent of each item to net sales.
3. Schedule of General Expenses, with analysis showing: (a) per cent of each item to total general expense; (b) per cent of each item to net sales.
4. Schedule of Financial Management Expenses and Income, with analysis showing: (a) per cent of each item to financial expense or income; (b) per cent of each item to net sales.

EXHIBIT C. The Statement of Cost of Goods Manufactured (with goods in process distributed) and supporting schedules:

1. Statement of Cost of Goods Manufactured, with analysis showing: per cent of each item to total manufacturing costs.
2. Schedule of Overhead Expenses, with analysis showing: (a) per cent of each item to total overhead expenses; (b) per cent of each item to total manufacturing costs.
3. Unit cost and cost of sales report, showing materials, direct labor, and burden costs per unit of product manufactured.

Miscellaneous Ratios and Per Cents—

(A) Profit Ratios:

1. Ratio of profits to total capital employed.
2. Rate of earnings on common stock.

(B) Working Capital:
  1. Statement of working capital, and ratio of current assets to current liabilities.

(C) Turnovers:
  1. Turnover of finished goods.
  2. Turnover of total inventories.
  3. Turnover of current assets.

(D) Analysis of Accounts Receivable:
  1. Credit terms, 2%/10, n/30. What per cent of sales remain uncollected?
  2. On the basis of the average monthly sales, assuming them to be uniform throughout the year, what is the amount of delinquent collections, and the average age of the undiscounted accounts? (See note below.)
  3. Ratio of bad debts to sales.

(E) Analysis of Accounts Payable:
  1. Per cent of purchases unpaid. Terms, 3/15, n/45.
  2. Per cent of accounts paid within the discount period.

(F) Analysis of Raw Material Purchases and Inventories:
  1. Per cent of purchases remaining in raw material inventory.
  2. Per cent of month's raw material requirements provided by opening inventory.

(G) Analysis of Cost Manufacture:
  1. Ratio of cost of goods manufactured to closing inventory of finished goods.
  2. Per cent of month's sales requirements provided by opening inventory of finished goods.
  3. Distribution of manufacturing cost among: goods in process at end of period; finished goods at end of period; goods sold during the period.

(H) The ratio of the inside or owner's equity to total liabilities.

(I) The ratio of sales to fixed assets, i.e., plant, and to the total capital employed.

(NOTE the sales discount taken compared with the possible discounts, also the fact that the discount has not expired on sales from December 22 to December 31, inclusive.)

PROBLEM 4

Northwest Lime and Cement Company

TRIAL BALANCE—DECEMBER 31, 1928

1. Buildings (Factory and Office)	$188,500.00	
2. Land	51,000.00	
3. Delivery Equipment	6,387.50	
4. Tools	8,391.16	
5. Machinery	141,750.90	
6. Furniture and Fixtures	13,197.82	
7. Patents	3,000.00	
8. Goodwill	13,000.00	
9. Dividends		$ 7,700.00
10. Interest Bonds Payable	3,500.00	
11. Freight-In	8,297.86	
12. Freight-Out		2,786.50
13. Securities (Temporary)	12,590.00	
14. Catalogues, Pamphlets	870.00	
15. Collection Expenses	3,750.62	
16. Extraneous Loss (Suspense)	9,760.50	
17. Outdoor Advertising	1,500.00	
18. Advertising	8,350.60	
19. Donations	200.00	
20. Entertainment of Customers	310.50	
21. Industrial Insurance	1,186.44	
22. Rents Workmen's Houses		4,476.80
23. Maintenance Workmen's Houses	3,070.80	
24. Bonus to Direct Labor	2,690.75	
25. Watchman's Wages	905.70	
26. Credit Report Expenses	375.00	
27. Transportation Claims	3,980.62	
28. Laboratory Expenses	2,805.26	
29. Accounting Department	2,010.00	
30. Legal Expenses	982.74	
31. Bad Debts Collected		25.67
32. Delivery Expenses	3,460.72	
33. Insurance	2,403.81	
34. Petty Cash	250.00	
35. Due Consignors		4,860.72
36. Raw Materials Inventory, Jan. 1, 1928	22,176.42	
37. Finished Goods Inventory—Lime, Jan. 1, 1928	18,369.74	
38. Trade Debtors	172,640.38	
39. Notes Receivable	19,392.86	
40. Notes Receivable Discounted		8,991.43
41. Raw Materials and Quarried Purchases	257,450.51	
42. Sales—Lime Products		483,129.63
43. Sales—Cement		161,400.34

44.	Returned Sales—Lime	$ 3,670.69	
45.	Returned Sales—Cement	2,831.17	
46.	Raw Materials Returned		$ 5,667.18
47.	Cement Bags Returned		834.15
48.	Cooperage Supplies	10,418.16	
49.	Direct Labor—Lime Mfg.	93,862.29	
50.	Indirect Labor—Lime Mfg	6,998.47	
51.	Foremen's Wages	5,025.00	
52.	Light, Heat, Power Department	9,436.74	
53.	Miscellaneous Factory Expenses	298.67	
54.	Accounts Payable		59,649.80
55.	Office Expenses	2,090.17	
56.	Warehouse Labor—Finished Goods	450.72	
57.	Repairs to Machinery	2,986.40	
58.	Repairs to Buildings	3,040.68	
59.	Drawings and Patterns	8,374.25	
60.	Res. for Depreciation of Buildings		18,437.12
61.	Res. for Depreciation of Machinery		31,834.62
62.	Res. for Depreciation of Delivery Equipment		1,564.30
63.	Res. for Depreciation of Furniture and Fixtures		1,032.87
64.	Res. for Depreciation of Patents		900.00
65.	Res. for Bond Sinking Fund		33,000.00
66.	Res. for Contingencies		32,850.75
67.	Interest Income		8,432.86
68.	Interest Paid—Operating	9,486.70	
69.	Salesmen's Salaries	10,432.61	
70.	Salesmen's Commissions	11,941.39	
71.	Reserve for Bad Debts		3,068.43
72.	Discount on Sales	8,196.87	
73.	Discount on Purchases		4,386.42
74.	Office Salaries	6,835.42	
75.	Capital Stock—6% Preferred		150,000.00
76.	Capital Stock—Common		200,000.00
77.	Unissued Preferred Stock	20,000.00	
78.	Treasury Stock Common	35,000.00	
79.	Surplus		100,682.08
80.	Employees' Benefit Fund	30,642.71	
81.	Bonds Payable, 1915—1935		100,000.00
82.	Res. for Employees' Benefit Fund		30,642.71
83.	Discount on Bonds	5,751.00	
84.	City National Bank	17,432.86	
85.	Bond Sinking Fund	33,000.00	
86.	Res. for Redemption of Preferred Stock		32,800.00
87.	Taxes (Local)	3,375.25	
88.	Purchases—Cement	116,439.69	
89.	Lime in Process, Jan. 1, 1928	6,982.73	
90.	Notes Payable		20,120.39
91.	Commissions Earned		3,056.34
92.	Res. for Depreciation of Workmen's Houses		$ 5,896.39
93.	Wrapping and Shipping Supplies	$ 839.60	
94.	Floating Equipment	11,886.98	
95.	Workmen's Houses	18,392.17	
96.	Roads and Tramways	5,861.70	
97.	Warehouse in Construction	8,173.06	
98.	Commissary Department (Income)	589.08	
99.	Hotel Account (Revenue)	80.75	
100.	Farm Account (Revenue)	1,639.43	
101.	Inventory Cement, Jan. 1, 1928	12,318.64	
102.	Res. for Depreciation of Floating Equipment		4,445.96
103.	Inventory Commissary Dept., Dec. 31	9,382.20	
104.	Furniture and Fixture Expenses		
105.	Bad Debts		
106.	Depreciation		
		$1,522,673.46	$1,522,673.46

NORTHWEST LIME AND CEMENT COMPANY

ADJUSTMENTS—DECEMBER 31, 1928

(A) INVENTORIES, DECEMBER 31, 1928:

1.	Cooperage Supplies	$ 392.70
2.	Wrapping and Shipping Supplies	307.85
3.	Catalogues and Pamphlets	215.37
4.	Outdoor Advertising	1,500.00
5.	Lime on Hand	14,316.15
6.	Cement on Hand	8,369.82
7.	Raw Materials	16,771.29
8.	Light, Power Supplies	639.80
9.	Lime in Process: Materials	1,743.69
10.	Labor	1,976.43
11.	Manufacturing Burden	2,516.78
12.	Laboratory Supplies	175.00
13.	Insurance Prepaid	915.71
14.	Interest Prepaid	317.25

(B) ACCRUALS:

15.	Direct Labor	3,178.56
16.	Indirect Labor	1,483.61
17.	Maintenance Workmen's Houses	478.48
18.	Delivery Expenses	481.20
19.	Interest (Cost)	421.78
20.	Interest Bonds	3,500.00
21.	Taxes (Local)	2,995.73

(C) SUSPENSE ADJUSTMENT:

22.	Extraneous Loss Suspense—Write off	1,952.10

(D) **Depreciation at the Following Rates and Amounts:**

23.	(a) Workmen's Houses 6% (Extraneous Expense)	$ 1,103.53
24.	(b) Floating Equipment 5% (Manufacturing)	594.35
25.	(c) Buildings (Allotted)	5,655.00
26.	(d) Machinery (Manufacturing)	14,021.80
27.	(e) Delivery Equipment (Selling)	785.93
28.	(f) Furniture and Fixtures (Allotted)	659.89
29.	(g) Patents (Manufacturing)	400.00
30.	(h) Loss on Tools (Manufacturing)	732.80

(E) **Miscellaneous Adjustments:**

31.	Write off Bond Discount	639.00
32.	Add to Sinking Fund Reserve and to Sinking Fund	3,000.00
33.	Add to Res. for Contingencies	6,500.00
34.	Add to Res. for Redemption of Preferred Stock	4,800.00
35.	Add to Res. for Bad Debts	1,473.80
36.	Transport Claims are 80% good. Set up reserve. 85% of the loss was on Cement Purchases.	

(F) **Distribute The Following Costs:**

	(a) Building Expenses:			
37.	Watchman's Wages	(25)		905.70
38.	Depreciation on Buildings			5,655.00
39.	Repairs to Buildings	(58)		3,040.68
40.	Insurance	(33)		1,488.10
	as follows:			$11,089.48
41.	(1) Manufacturing		45%	
42.	(2) Selling		35%	
43.	(3) Office		20%	
44.	(b) Light, Heat, and Power costs on same basis as Building's Expense.			
45.	(c) Furniture and Fixture depreciation same as Building's Expense.			
46.	(d) Freight-In to Raw Materials:			
47.	Lime		60%	
48.	Cement Purchases		40%	
	(e) Taxes (Local):			
49.	Manufacturing		50%	
50.	Workmen's Houses		5%	
51.	Floating Equipment (Mfg.)		6%	
52.	Selling		30%	
53.	Office		9%	
			100%	

54. During 1928, $7,800 in Preferred dividends, and $3.906.43 in Common dividends were declared.
55. Goodwill was written down $2,000.
56. Real Estate was written up $1,000.

Required:

Written report to the Board of Trustees explaining in complete detail all factors that have contributed to the progress of the business, as revealed through the accounting records, during the year ending 1928. It is suggested that the report cover all of the activities of the following departmental heads:

(a) The works manager who has charge of all production procedures.
(b) The sales manager who has charge of sales and expense budgets.
(c) General manager who has charge of general expense budgets.
(d) Finance manager who handles credits and collections as well as the general direction of financial policies.
(e) The chief accountant.

It is suggested that use also be made of the report showing the portion of this year's loss or gain expressed in dollars, attributable to (a) changes in volume of business; (b) increases or decreases in the items of manufacturing expenses, selling expenses, general administrative expenses, and financial management expenses. Note that sales prices of lime and cement remained unchanged during 1927 and 1928.

The data for these reports should be based upon the following statistical and accounting information:

Exhibit A. Balance Sheet, with supporting schedules together with analysis showing:

1. Per cent of each reserve to its related asset account.
2. Per cent of each current asset to total current assets and to total assets.
3. Per cent of each fixed asset to total fixed assets and to total assets.
4. Per cent of each group of assets to total assets.
5. Per cent of each liability to its related group and to total liabilities.

Exhibit B. Profit and Loss Statement, with supporting schedules together with analysis showing:

1. Schedule of Selling Expenses, showing per cent of each item to total selling expenses and also per cent of each item to net sales.
2. Schedule of General Expenses, showing per cent of each item to total general expenses and also per cent of each item to net sales.

3. Schedule of Financial Expenses, showing per cent of each item to total financial expenses and also per cent of each item to net sales.
4. Per cent of total group (Selling, General, and Finance) to net sales.

Exhibit C. Statement of Cost of Manufactured Goods and Cost of Sales, with supporting schedules, together with analysis showing:

1. Per cent of each item to total manufacturing costs.
2. Per cent of each manufacturing expense to total factory overhead.

Exhibit D. Comparative Balance Sheet, showing the trend of funds in structural form, featuring:

1. New fixed asset financing.
2. New working capital financing.
3. Trends of various items in index numbers. (See page 83 for illustration of the method.)

Exhibit E. Comparative Profit and Loss Statement, showing increase or decrease of items in per cents:

1. Per cent of each item to net sales of the year.
2. Increase or decrease of each per cent in successive years based on sales as 100%.

Exhibit F. Comparative Statements, showing absolute changes in dollars and also per cents of increase or decrease:

1. Profit and Loss Statements, with analysis showing: (a) increase or decrease of each item in dollars; (b) per cent of increase or decrease, based on first year.
2. Statement of Cost of Goods Manufactured, with analysis showing: (a) increase or decrease of each item in dollars; (b) per cent of increase or decrease, based on first year.
3. Schedules of Manufacturing Expense, with analysis showing: (a) increase or decrease of each item in dollars; (b) per cent of increase or decrease, based on first year.
4. Schedules of Selling Expense, with analysis showing: (a) increase or decrease in each item in dollars; (b) per cent of increase or decrease.
5. Schedules of General Expense, with analysis showing: (a) increase or decrease in each item in dollars; (b) per cent of increase or decrease.
6. Schedules of Financial Expense and Income, with analysis showing: (a) increase or decrease in each item in dollars; (b) per cent of increase or decrease.

Comparison of Miscellaneous Ratios and Per Cents—

(A) Profit Ratios:
  1. Ratio of profits to capital, second year compared with first year.
  2. Rate of earnings on common stock. Preferred bears 6%, second year compared with last year.

(B) Turnovers:
  1. Turnover of finished goods, compared with last year.
  2. Turnover of total inventories, compared with the first year.
  3. Turnover of current assets, compared with last year.

(C) Analysis of Accounts Receivable:
  1. Credit terms, 2%/10, n/30. What per cent of sales remain uncollected, compared with last year?
  2. On the basis of the average monthly sales, assuming them to be uniform throughout the year, what is the amount of delinquent collections compared with first year, and their average age?
  3. Ratio of bad debts to sales compared with last year?

(D) Analysis of Accounts Payable:
  1. Per cent of purchases of lime and cement unpaid. Terms, 3/15, n/45.
  2. Per cent of accounts paid within the discount period, both compared with last year.

(E) Analysis of Raw Materials Purchases and Inventories:
  1. Per cent of purchases remaining in raw material inventory, compared with last year.
  2. Per cent of month's raw material requirements provided by opening inventory, compared with last year.

(F) Analysis of Cost Manufacture:
  1. Ratio of cost of goods manufactured to closing inventory of finished goods.
  2. Per cent of month's sales requirements provided by opening inventory of finished goods compared with last year.
  3. Distribution of manufacturing costs among goods in process at end of period; finished goods at end of period; goods sold during the period, compared with last year.

(G) Working Capital:
  1. Statement of working capital, and ratio of current assets to current liabilities, compared with last year.
  2. Has the firm a sufficient amount of working capital? Report under finance manager.

(H) Ratio of inside or owners' equity to total liabilities.

(I) Make such additional reports as you think necessary to properly analyze the causes for change in the operating and financial condition of the firm.

Northwest Lime and Cement Company

Extraneous Expenses and Income

The following statements cover the extraneous expenses and income. Suggested procedures for analyzing and controlling these activities may be found with each separate report.

(A) Working Men's Houses. The data are found in the general ledger trial balance.

(B) The Farm Revenue account is made up of the following details:

	1927	1928
Income:		
1. Sales of Hay	$1,390.50	$1,150.60
2. Sales of Livestock	2,874.25	2,980.75
3. Sales of Produce	3,412.80	3,365.30
	$7,677.55	$7,496.65
Expenses:		
1. Labor	$3,542.90	$3,370.40
2. Supplies for Farm	1,150.75	985.65
3. Household Supplies	428.60	580.90
4. Repairs and Maintenance, Building, etc.	2,542.20	1,832.20
5. Road Repairs	505.00	495.75
6. Miscellaneous Expenses	2,375.50	1,871.18
	10,544.95	9,136.08
Net Loss for Year	$2,867.40	$1,639.43

1. The produce and livestock were sold to the commissary at "approximate cost of production." This cost was determined by taking the current prices for produce for the day and deducting 15% for store profit.

2. The farm accounts are kept in the main office by the bookkeeping staff and incorporated with the general bookkeeping records.

3. Instructions: Make a separate brief report on the farm operations looking toward the elimination of the annual loss which has recurred for several years.

(C) Northwest Lime and Cement Company—Commissary Department:

	1927	1928
Sales	$37,864.79	$29,319.79
Inventory, Jan. 1	18,392.80	7,561.32
Purchases and Freight	20,397.65	24,386.45
Total Costs Merchandise	38,790.45	31,947.77
Less Inventory, Dec. 31	7,561.32	9,382.20
Cost of Goods Sold	31,229.13	22,565.57
Gross Trading Profit	$ 6,635.66	$ 6,754.22
Salary of Manager	2,100.00	2,400.00
Clerk Hire	1,672.45	1,842.85
Delivery Costs (upkeep of auto)	429.75	683.97
Posters and Advertising	85.52	175.90
Miscellaneous Expenses	1,139.87	1,852.03
Bad Debts and n.s.f. Checks	375.40	388.55
Total Expenses	5,802.99	7,343.30
Net Profit or Loss*	$ 832.67	$ 580.08*

1. No rent or interest is charged to commissary department. It handles a general line of merchandise for the employees and the town population, being the only store in the community. All supplies are requisitioned from stores, and charged to the hotel and farm.

2. A separate set of books is kept by the commissary department. Goods are sold for cash to customers. The profit is shown separately as commissary income.

3. Instructions: Check over as many factors as you can find and make a separate report outlining the procedure for:

(a) Research on profit possibilities for the commissary department. Use data found in the problem and the statements.

(b) Improvement in the accounting system looking toward the introduction of economics in management.

(c) Improvement in the control over the commissary department as a whole.

(D) Northwest Lime and Cement Company—Hotel Report:

	Month ending Dec. 31, 1927	1928
INCOME:		
1. Room Rentals	$ 5,396.80	$5,680.10
2. Dining Room	10,432.75	9,832.75
3. Miscellaneous	2,198.70	2,439.60
	$18,028.25	$17,952.45
EXPENSES:		
1. Labor	$6,342.60	$6,050.25
2. Food Supplies	9,945.15	9,221.80
3. Incidentals. Repairs, Upkeep, etc.	2,732.30	2,761.15
	19,020.05	18,033.20
Profit or Loss*	$991.80*	$80.75*

1. The hotel is operated primarily as a dining hall for the workmen and for summer tourists.

2. "The food supplies and incidental costs are stores charged from the commissary department at cost plus 10%." (Report of the bookkeeper.)

3. INSTRUCTIONS: Outline a system of accounting that you believe will more adequately control this service department. Make suggestions covering internal checks that will at least reduce the loss to a minimum.

4. Compare these figures with statistics of similar-sized institutions.

PROBLEM 5

Northwest Lime and Cement Company

CREDIT UTILIZATION

1. The bond issue authorized amounted to $200,000, of which $100,000 was outstanding December 31, 1928. The deed of trust recites that the following assets, naming their amounts at date of pledge in 1922, have been deeded to the trustee as security for the total issue: land, buildings, machinery and tools in buildings, furniture and fixtures, workmen's houses, tramways, and all improvements thereto in process of construction, or hereinafter acquired and attached to land.

2. On December 31, 1928, the following current assets were under pledge to the City National Bank, to cover the notes payable $12,334.62: trade debtors $25,000, and the securities $12,590.

3. $5,000 of the raw materials are pledged with S. & Co., a general creditor to satisfy his bill.

4. A $10,500 barreling machine is under a $7,500 purchase money mortgage and is being paid off at the rate of $500 per month. The original amount of the mortgage was $10,500 and has been reduced to the amount noted which is included in the notes payable.

5. The employees' benefit fund is a trust fund held for the employees who operate a mutual benefit association. No portion of the money is contributed by the company.

6. The account "Due Consignors" is a straight liability for merchandise sold. None of the inventories represent consigned goods.

7. The Notes Receivable Discounted represent notes sold by indorsement with recourse.

Required:

Make a credit utilization report in support of a bank loan of $50,000 from the local bank.

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